

MATERIAL FLOW

HANDLING • PRODUCTION • PACKAGING AND SHIPPING

JANUARY, 1954

FRANCHISE
CIRCULATION

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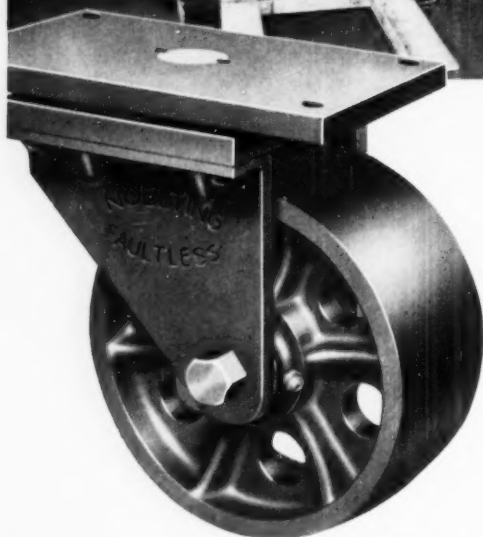
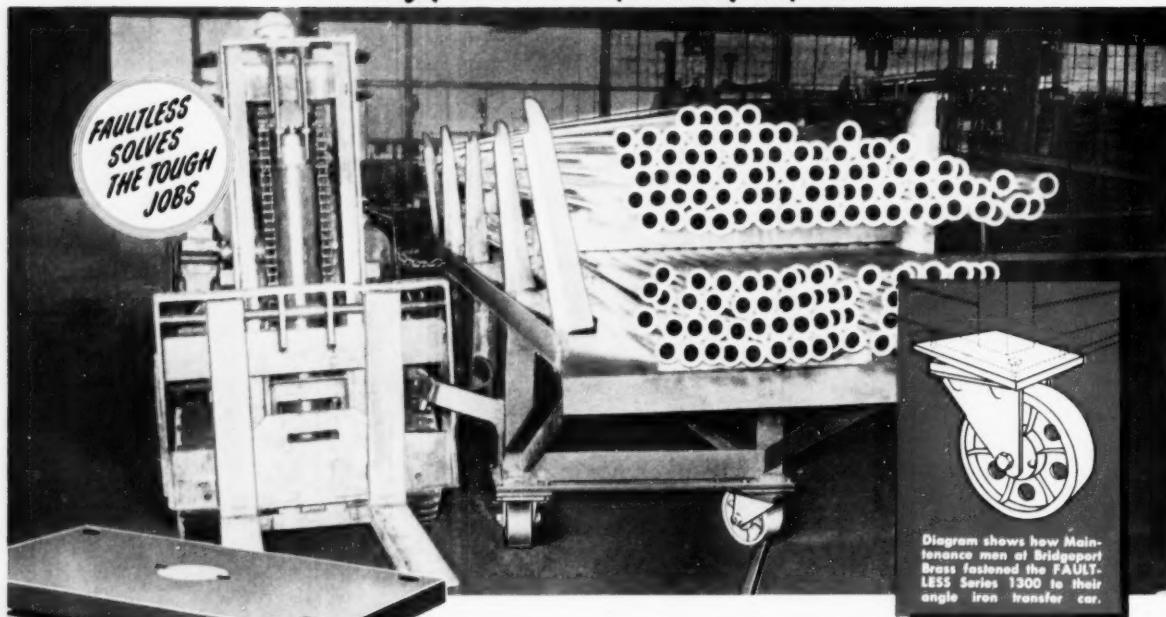
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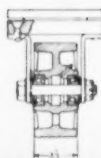
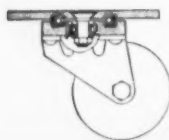
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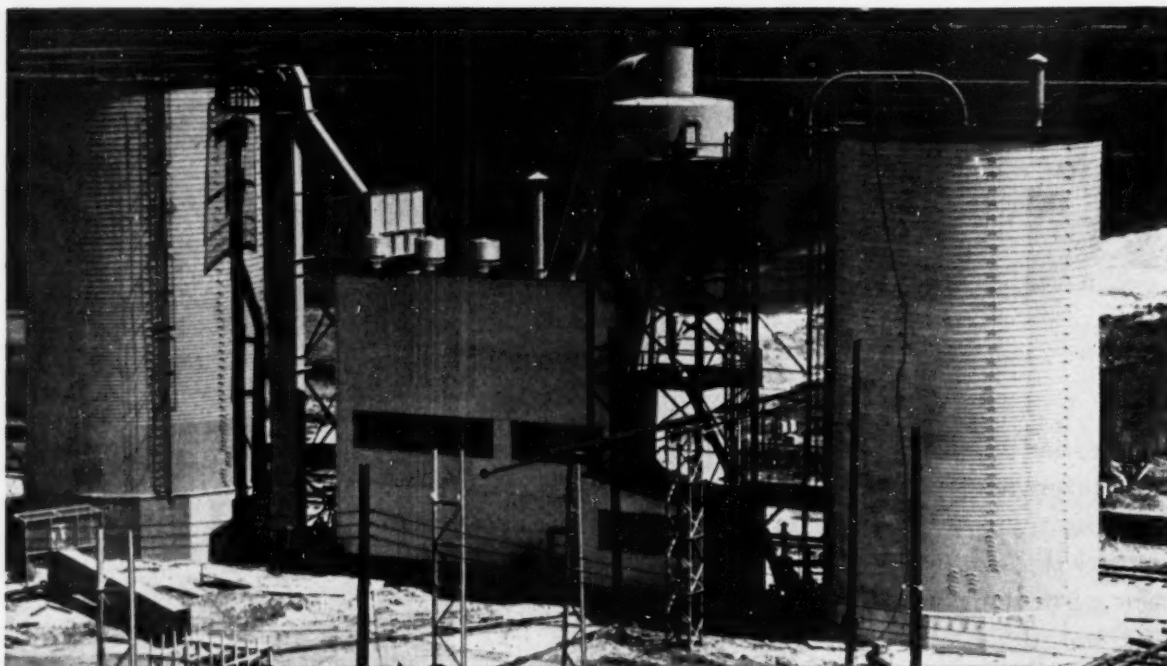
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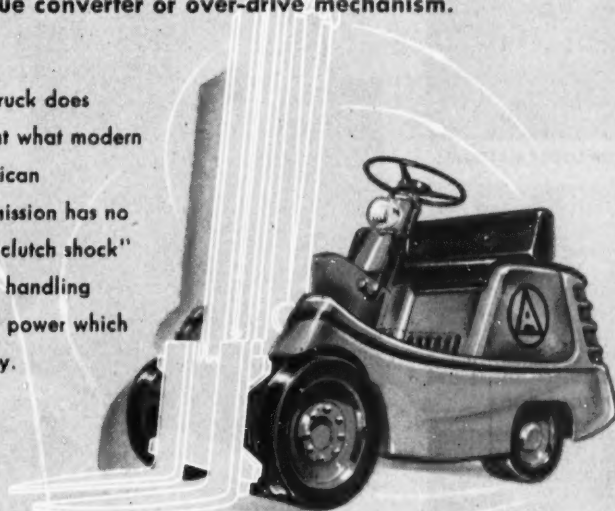
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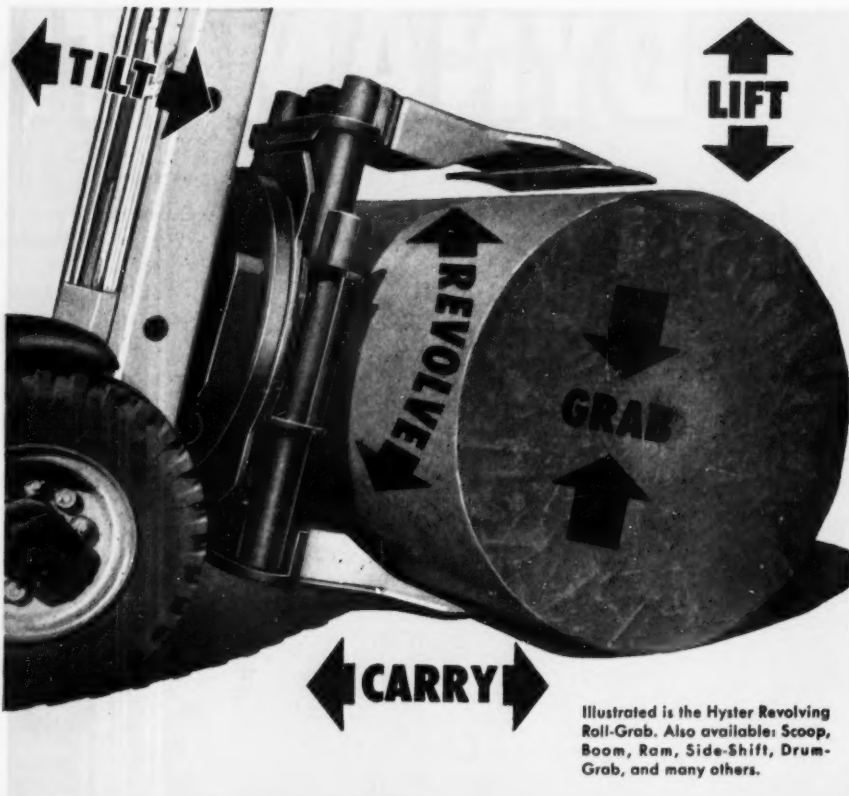
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MATERIAL FLOW

JANUARY, 1954
VOLUME 9, NO. 4

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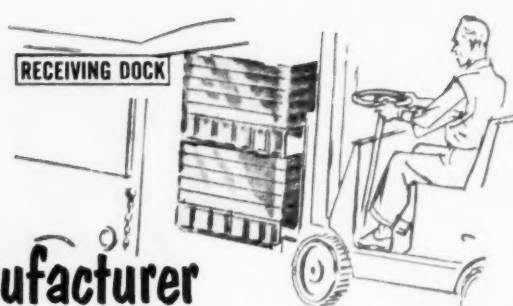
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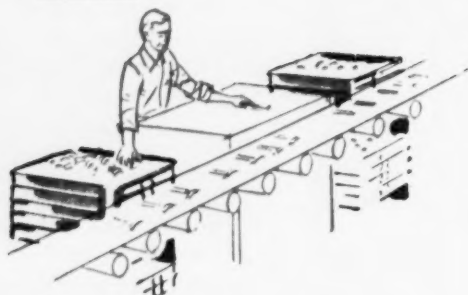
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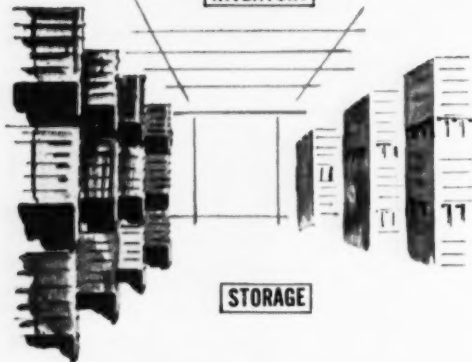


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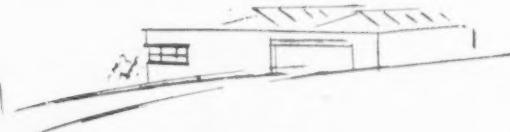
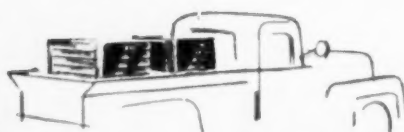


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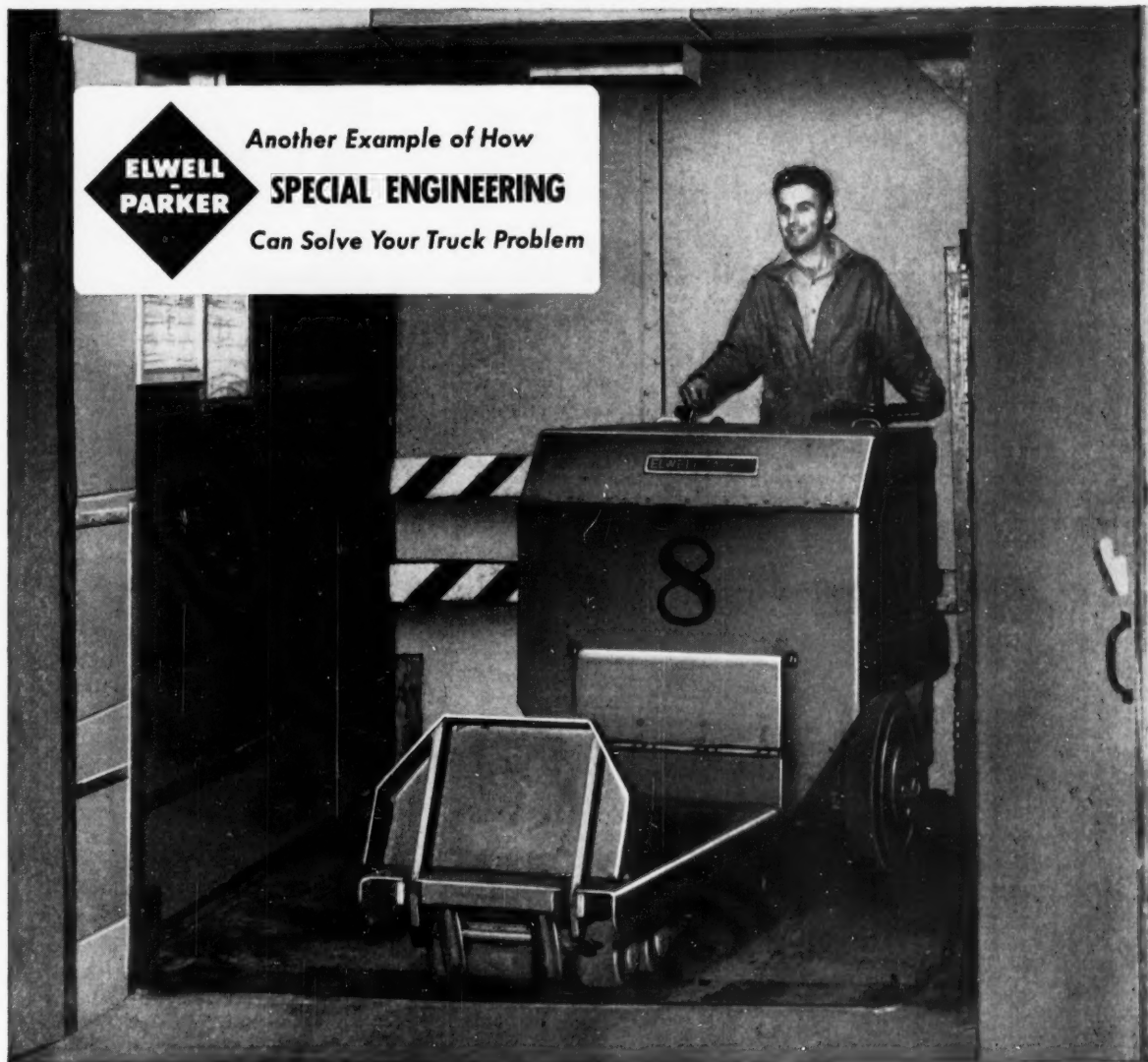
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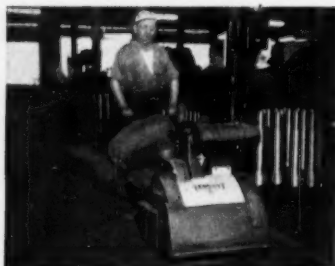
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LETTERS to the editors

Fine-tooth Combing

To FLOW:

In the August issue of FLOW I read an article written by Prof. John R. Huffman about, "How to Determine The Best Flow Planning Technique." This article was indeed very interesting as an approach to the problem of layout planning. As far as the theory contained in this article is concerned I fully agree with Prof. Huffman's proposal and I think it worthwhile to give it careful consideration. However, I would give a few comments on the formulas mentioned in the article.

On page 67 a serious mistake has been made by either the writer or the printer. The formula should be as follows:

$$t = (a_1 + bx_1) + (a_2 + bx_2) + (a_3 + bx_3) \dots + (a_n + bx_n)$$

On page 68 the heavier portions in figure 3 are not in accordance with the text.

The formulas on page 78 should read:

$$t = 5(.644 + (.0071)200) = 10.32 \text{ min.}$$

$$t = 5(.644 + (.0071)100) = 6.77 \text{ min.}$$

Furthermore, the reduction in time obtained by reducing the distance from 1000 feet to 500 feet (10 steps) is not 13.54 - 10 min., but 13.54 - 9.99 min., which gives 3.55 min. This is the same result as obtained when the other two formulas on this page are worked out in the correct way.

In both cases the actual time-saving is 3.55 min. Of course, the saving in percent is different as the number of steps differs and therefore the constant elements have more influence on the total time. In this respect I agree with Prof. Huffman, but in my opinion it should have been mentioned



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LETTERS

Continued

that the actual timesaving in both cases is the same.

On page 33 a mistake has been made in the main formula. Prof. Huffman gives the time in minutes since $(a+bx)$ is expressed in minutes, but he gives c_1 in cost/hour. Logically, he should either divide $(a+bx)$ by 60 or give c_1 in cost/min.

So for my remarks. Nevertheless, I think the article a valuable contribution to the solution of the flow planning problem and I fully agree with the conclusions about the required data.

M. Walraven
K.L.M. Royal Dutch Airlines
Amsterdam, Holland

Editor's note: Fortunately, we were able to obtain Prof. Huffman's reply to the foregoing letter in time to publish both together. The following is Prof. Huffman's letter.

To FLOW:

Thank you very much for forwarding to me a copy of Mr. Walraven's letter about the article on flow planning. He has certainly read it carefully, and pointed out discrepancies that may be bothering other readers. His comment about mentioning the common time saving is well taken and appreciated. The discrepancies, with the exception of the formula sign and the chart, are in the original manuscript. I originally intended to round all times such as 9.99 minutes to the nearest tenth of a minute because that is about all the accuracy that is justified by the variability of time study data. But I did not do this, and the inconsistency noted by Mr. Walraven was the result.

I want to thank him for his letter. I was pleased to see that the ideas it contained withstood his careful scrutiny.

John R. Huffman
Associate Professor Industrial
Engineering,
University of Southern California
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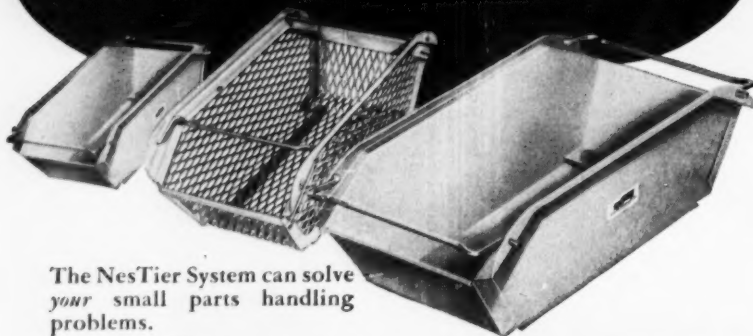
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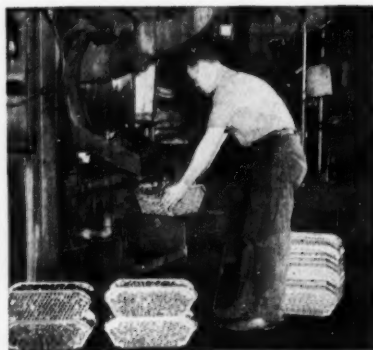
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NesTiers are available in three standard sizes and in a variety of materials and finishes. No matter what your problem is there is a standard NesTier to solve it.



NesTier No. 175 baskets in use at a Ford Motor Co. plant. Parts taken from washer are quickly drained while moving along to the next operation.



NesTier No. 120 boxes on assembly line. Fusite Corp. finds them particularly suited for very small parts, ideal for women workers to handle.



NesTiers may be transported filled or empty by any type conveyor. At this Chrysler plant, filled No. 220 boxes move easily by truck.

MODEL	WEIGHT	A		B		C		D		E	
		1	2	1	2	1	2	1	2	1	2
120 BOX	3 LBS.	12	7 1/4	4 1/4	6 1/2	5 1/2					
175 BOX	6 LBS.	18 1/4	9 1/4	6 1/4	11 1/4	7					
175 BASKET	4 1/4 LBS.	18 1/4	9 1/4	6 1/4	11 1/4	7					
220 BOX	11 LBS.	22 1/2	12 1/2	7 1/4	14 1/4	8 1/2					
220 BASKET	7 1/4 LBS.	22 1/2	12 1/2	7 1/4	14 1/4	8 1/2					

THE CHAS. WM. DOEPKE MFG. CO., Inc.,
ROSSMOYNE, OHIO

NESTIER

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association and society NEWS

● "Looking Forward With Industry" is the title of an address to be presented before the Falls Cities Chapter of the AMHS when that group convenes in Louisville January 28. The speaker will be Archie P. Cochran, president of the Cochran Foil Co., of that city.

● The Philadelphia Chapter of the AMHS is slated to hear John W. Powischill, of Proctor & Schwartz, at its next meeting January 15. His topic will be, "Automatic Handling In The Textile Fiber Field."

● Announcement of the 47th annual exhibit of the Canning Machinery and Supplies Association was made recently by Hal Johnston, president of the association. The exhibit will be held in Atlantic City in conjunction with the National Canners Convention, Jan. 23-27. At least 137 exhibitors have indicated they will occupy the 102,000 square feet of booth space.

● Roth F. Herrlinger, president of the Gummed Products Company, was unanimously elected president of the Gummed Industries Association at its annual convention held recently at White Sulphur Springs, West Virginia. His election marks the second time he has been so honored by the

(Continued on page 16)

LESS DOWN TIME More Profit Time

BUDA LIFT TRUCKS

STRIP FOR SERVICE IN 22 SECONDS...
DISASSEMBLE COMPLETELY IN 22 MINUTES!



BUDA "FT"

SERIES LIFT TRUCKS
BREAK ALL
MAINTENANCE RECORDS

Get This Facts Book

See for yourself WHY Buda is the
safest, most maneuverable, most
economical and easiest to maintain
fork truck in the field.

Write today for your free copy!



BUDA

The Buda Company, Harvey, Illinois
Division of Allis-Chalmers Manufacturing Company



Chore Boys



Industrial Tractors



Fork Lift Trucks

The Line With ALL3 For Diversified Handling

Your Buda Fork Lift Truck will spend more time in operation... less time 'dead-lined' for service, maintenance or repairs. From the all-welded, automotive type frame to the easily removed side panels and engine cowl, every component is designed for speedy, efficient servicing. It takes one man only 22 seconds to strip the truck for service, and one man only 22 minutes for complete disassembly! Clutch replacement takes approximately 30 minutes. But fast assembly and disassembly are only part of the "more-profit-time" story. Buda builds these new FT Lift Trucks so that parts last longer and need little or no attention. Buda's amazing 85% part interchangeability between various models keeps stock inventory to the minimum, too. Be sure to compare Buda before you buy. Thirty-six models to choose from—

18 Diesel and 18 gasoline.

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MAKES 6-FT. AISLES PRACTICAL

RAYMOND

Reach-Fork*

TRADE MARK

NO NEED FOR SPECIAL RACKS OR PALLETS
USE YOUR EXISTING EQUIPMENT

GAIN UP TO 50%
MORE STORAGE

- It's here . . . the day you can install 6 ft. aisles without antiquating your present racks or pallets. Only the Raymond REACH-FORK enables you to use existing warehouse equipment because only the REACH-FORK has "boarding house reach". With this great new electric truck, you double your storage capacity simply by reducing the width of your aisles.

● SEND FOR BULLETIN

The RAYMOND CORPORATION

3322 Madison St., Greene, N.Y.

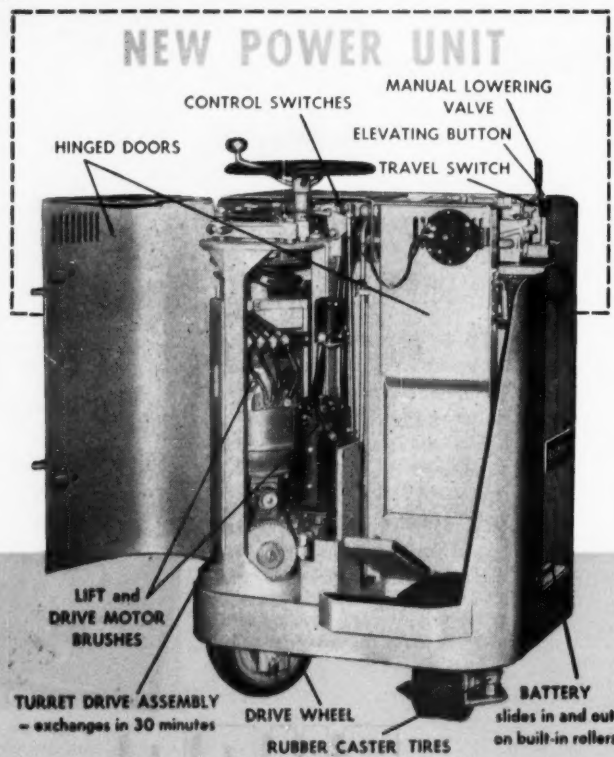
- () Please send me a REACH-FORK Bulletin.
() Please have your representative call.

NAME _____ TITLE _____

COMPANY _____

STREET _____

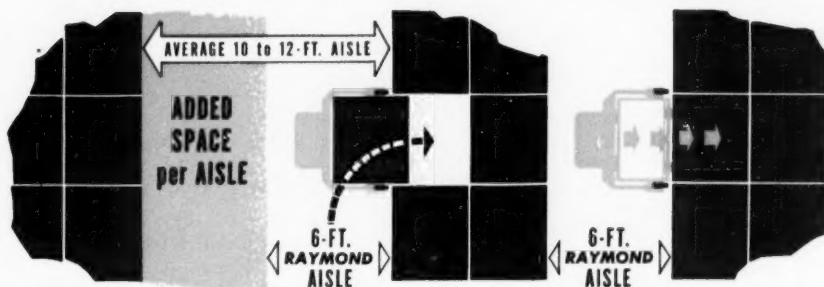
CITY _____ STATE _____



REACH-FORK Power Unit opens up like a book for fast, easy servicing. All parts are housed behind hinged double doors . . . nothing under the unit to inspect or service except the wheels. New Power Unit provides maximum operation with a minimum of downtime . . . plus greater rider comfort and safety.

IN YOUR WAREHOUSE...NOW!

LOOK WHAT THE REACH-FORK DOES



- Gives you up to 50% more storage by right-angle tiering from 6 ft. aisles.
- Handles any size pallet . . . operates with any rack setup.
- Stacks pallets closely . . . ideal for truck trailer, boxcar, rack storage use.
- Weighs less than conventional tiering trucks . . . use it on low-capacity elevators, floors.
- Reaches right out to pick up . . . or deposit your load . . . forks extend 24" and back in seconds.
- Features 41" free lift for elevating loads in low-ceiling areas, truck trailers, boxcars.
- Cradles your load when traveling . . . forks have automatic 5° tilt.

MODEL E2RT

Capacity: 2,000 lbs.



ELECTRIC INDUSTRIAL TRUCKS

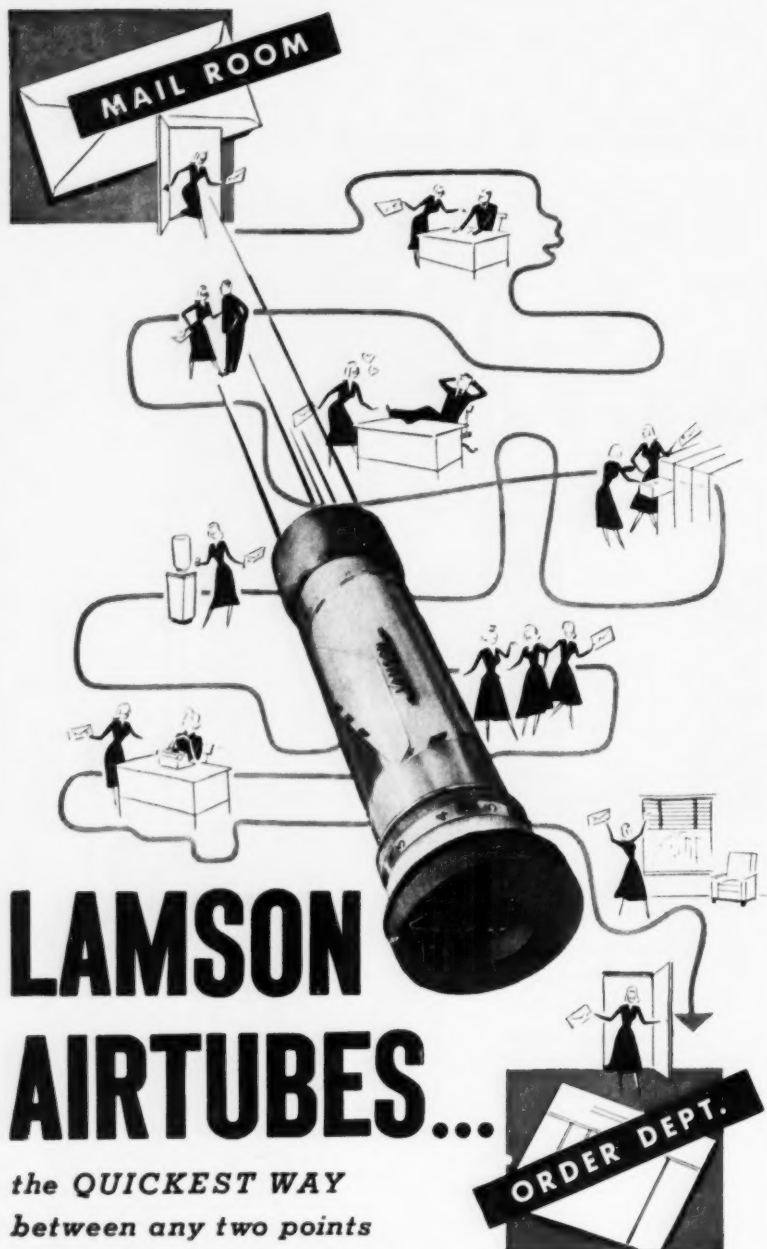
HYDRAULIC ELEVATING EQUIPMENT

*PATENT NO. 2,564,002

DON'T DELAY a single day! Learn how the Raymond REACH-FORK can make tremendous space-savings right in your own warehouse. Mail the coupon now.

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FLOW • JANUARY, 1954




LAMSON AIRTUBES...

*the QUICKEST WAY
between any two points
for handling mail, reports,
punch cards, drawings, test samples,
file folders, small tools, and
many other similar items.*

Plants at
Syracuse
and
San Francisco

Offices
in
principal cities



LAMSON CORPORATION

1401 Lamson Street, Syracuse 1, N. Y.

Yes, I'd like to know more about Lamson Airtube Systems. Please send me the descriptive case-history brochure, Airtubes on Target. No obligation, please.

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

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association. Other officers appointed include **T. H. Mitten-dorf, vice president** of the Hudson Pulp & Paper Corp., as vice president; and Philip O. Deitsch, who enters his seventh year of service to the Gumming Industry, was again named managing director, treasurer and secretary of the association.

● **J. S. Kirkpatrick, vice president** of research and development for Brooks & Perkins Inc., was unanimously re-elected president of the Magnesium Association at the general session of the Association's recent 9th annual meeting. L. G. White, of Dominion Magnesium, Ltd., was named vice president; J. V. Cosman, Superior Bearing Bronze Co., treasurer, and Miss M. I. Hanson, assistant secretary. According to president Kirkpatrick there were 450 registrants at the annual meeting, one of the most successful in the association's history.

● "Fixed and Variable Speed Conveyor Drives and Their Controls" will be the topic to be discussed at the February 2nd meeting of the Detroit Material Handling Section of the ASME. Speakers that evening will be Art Boerger and Ray Igras of the Ford Motor Co.

● The country's first scholarship in the field of material handling has been established at Illinois Institute of Technology. First recipient of the \$650 full tuition grant is Joseph Bragen, an industrial engineering student at Illinois Tech. Presentation of the \$650 check was made recently by Wilbur Warner, president of the Chicago Chapter of the AMHS, sponsors of the scholarship fund.



This battery just fell off the shipping dock!

The EDISON Nickel-Iron-Alkaline Storage Battery, shown being watered here, was undamaged while in a fork truck that fell 4½ feet off the shipping dock.

This rather extreme example points out one of the vital advantages you can enjoy with EDISON. The EDISON cells are steel cells, with plates and poles of steel—

assembled with modern machine tool precision. Such construction means unequalled battery strength for both rugged daily battery service and extremely long service life. For thousands of EDISON users, this has meant top performance for *more than twice the life* of conventional batteries . . . and the lowest over-all battery costs possible.

Learn more of EDISON's superior advantages for profitable industrial truck operations. Request a visit from the Edison field engineer nearest you. Write Edison Storage Battery Division, Thomas A. Edison, Incorporated, West Orange, N.J.

Most dependable power—lowest over-all cost . . . you get both with an EDISON



EDISON
NICKEL • IRON • ALKALINE
STORAGE BATTERIES

EDISON ALSO MAKES THE FAMOUS "V. P." VOICewriter AND THE TELEVOICE SYSTEM

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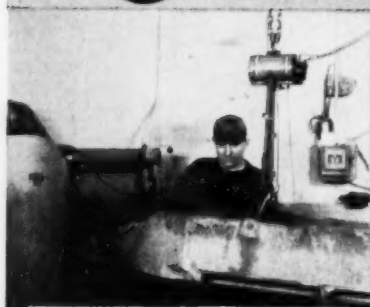


Faster... Safer... AIR HOIST

Lift 1000 lb. loads *faster... safer... and quieter* ... with ARO Air Hoists! Better all safety requirements ... motor explosion-proof. Small, compact, overall length 10 1/4" ... weighs only 28 1/2 lb. Vane-type motor, totally enclosed.

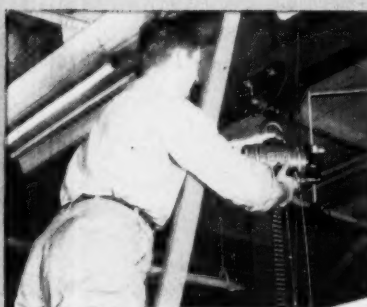
Saves time and labor for shipping docks ... heat treating departments ... refineries, chemical plants and plating departments ... machine shops and foundries ... appliance, furniture, textile, automobile and aircraft assembly lines ... stock rooms.

SEE YOUR ARO DISTRIBUTOR



FASTER... wide speed range. Quieter, too.

SAFER... no spark hazard ... safety construction throughout.



SMALLER... one man can easily install.

MORE USEFUL... unaffected in ordinary operation by dirt, fumes or heat.



THE ARO EQUIPMENT CORP.
BRYAN, OHIO
Offices in All Principal Cities
In Canada—Aro Equipment of Canada, Ltd.
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ARO

AIR HOIST
Also... Air Tools...
Lubricating Equip-
ment ... Aircraft
Products ... Grease Fittings

THE ARO EQUIPMENT CORP., BRYAN, OHIO

Please send full details on the new ARO Air Hoist, without obligation.

Name _____
Company _____
Street _____
City _____ State _____



... at General Electric Co.

A new district sales manager for the New England area has been appointed, according to an announcement by Lacy W. Goostree, manager of marketing for GE communications equipment. He is **Albert C. Shepherd**, who has been with the company since 1948 serving in radio communications engineering at Syracuse. Also appointed in the same territory to have headquarters in Boston was **Robert A. Giorgi**, who has been named communications specialist.



A. C. Shepherd

... at Buda Co.

Alvin Anderson, vice president in charge of west coast operations of the Buda Engine and Equipment Co., a wholly owned Buda Co. subsidiary, recently announced the appointment of **C. L. Thompson** as general manager of the Oregon branch of the company. The appointment is part of Buda's expansion program in the northwest's rapidly growing industrial and lumbering region.

... at Robertshaw-Fulton Controls Co.

Ralph V. Coles, assistant vice president, announced the recent appointment of **Lee E. Cuckler** as manager of the engineering department. He will be responsible for all application engineering and technical services. Prior to joining the

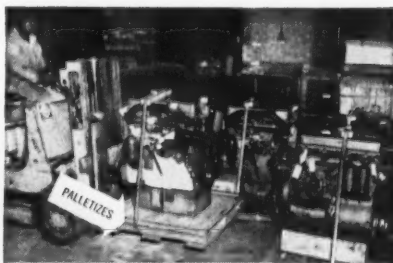
Circle No. 11 on Reader Service Card for more information

Acme Steel Strapping Insures S.A. *(Safe Arrival)*

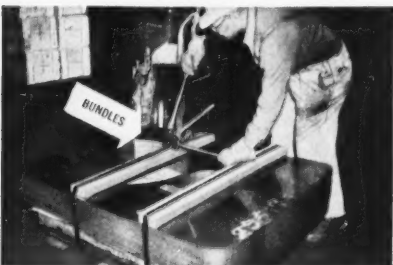
**Secures tractor parts for long-distance hauling
... saves time and trouble for International Harvester**



STRAPPING ON A TRACTOR. When International Harvester ships crawler tractors on open railroad flatcars, Acme Steel Strapping ties tool boxes, lubrication equipment and seat cushions in place for the journey.



SOLE SUPPORT for these IH Diesel engines is one Acme Steelstrap per engine. It secures the engine to a pallet for easy handling.



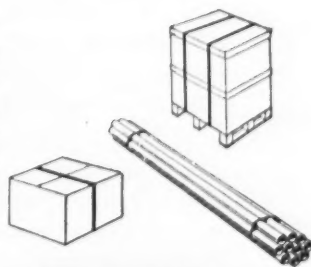
4,000 POUNDS of tractor dashboards are bundled together with Acme Steel Strapping for delivery from one International Harvester plant to another.

Whenever you receive anything secured with Acme Steel Strapping, you know that the shipper has taken care to get it to you safe. He has also beat the threat of damage-in-transit and has cut the cost of packing and shipping, too.

Acme Steel Strapping does all these things. It makes packing and loading easier and faster. It provides better protection during shipment, and

helps insure S.A. (Safe Arrival).

Almost certainly, Acme Steel Strapping or Acme Steel Stitching Wire methods can help somewhere in your operation. If you have any kind of a shipping or materials-handling problem, we may have just the idea you need. Write Acme Steel Products Division, Dept. F-113, ACME STEEL COMPANY, 2840 Archer Avenue, Chicago 8, Illinois.



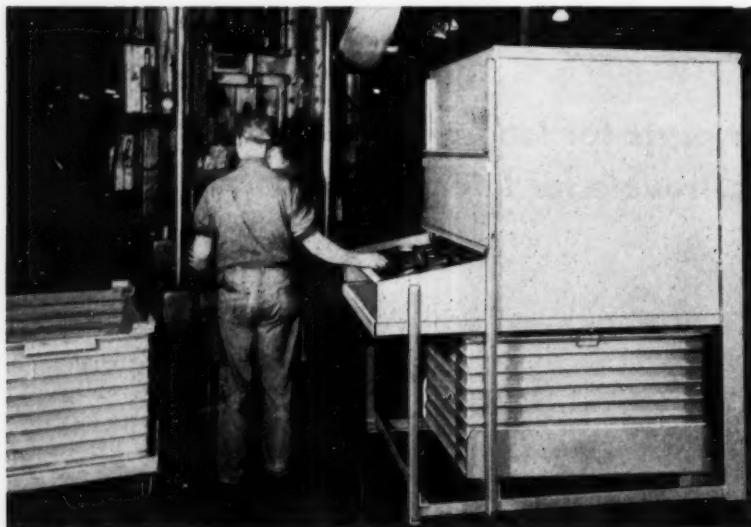
**ACME
STEEL**

STRAP IT... STITCH IT... SHIP IT... SAFELY!

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WORK-O-MATIC*

GRAVITY-FED HOPPERS...



Mass-Position

MATERIAL AT WORK LEVEL

- Giant 47.2 cu. ft. vertical storage hoppers feed automatically at work height.
- Fork truck operator fills hoppers mechanically, from any one of 8 directions, using Work-O-Matic drop-bottom box.
- Box stored under hopper increases storage to 67.4 cu. ft.—sufficient for full work periods in most operations.
- Eliminate need for in-process storage areas and costly re-handling, releasing fork trucks for other use.

Work-O-Matic Gravity-Fed Hoppers can save time and speed production in your plant. For details write to The Union Metal Manufacturing Company, Canton 5, Ohio.

*Patent No. 2,445,038. Other patents pending.

UNION METAL
Material Handling Equipment

Circle No. 141 on Reader Service Card for more information

MEN IN THE NEWS

Continued

company, Cuckler had been with Minneapolis-Honeywell Regulator Co.

... at Mercury Mfg. Co.

Several new appointments have been announced among executive personnel. **O. T. Henkle** has moved from vice president of sales to executive vice president. **P. K. McCullough**, formerly vice president of manufacturing, now is vice president of sales. **J. D. Appleberry**, who had been McCullough's assistant, has been named plant manager.

... Weber Addressing Machine Co.

The appointments of **James E. O'Connor** and **Arthur Wagner** as marking systems engineers have been announced by **C. E. Ritter**, general sales manager. Both men will be in the Chicago area and will offer sales assistance and engineering counseling. O'Connor was a customer service manager for Sears, Roebuck before joining the firm, while Wagner was a sales representative for Better Packages, Inc.

... at Thew Shovel Co.

R. G. Thibaut has been named service manager and **C. W. Raby** assistant service manager. Both men have been with the company for some time. Thibaut joined Thew in 1936 as assistant service manager. Raby has been with the company for 26 years as traffic manager and field service manager before attaining his new post.

... at General Box Co.

I. W. Preetorius, former vice president and traffic manager, has retired and is making his home and consultant office in Orlando, Fla. He is continuing to be active as an independent consultant for the packaging industry.

(Continued on page 141)

FLOW • JANUARY, 1954

There's no stopping
Hartley ... since he discovered
Heppenstall Tongs



There's no limit to the range of jobs
that **HEPPENSTALL SAFE-T-TONGS**
handle quickly, safely, economically

Whatever your handling job requires—regardless of shapes, weights, or sizes—a Heppenstall Safe-T-Tong engineered specifically to your needs will help you speed materials handling operations with greater efficiency and safety. Call Heppenstall now. Obtain complete information and technical assistance. Heppenstall Company, Pittsburgh 1, Pa. Sales offices in principal cities.

Heppenstall

... TONGS FOR EVERY LIFTING PROBLEM

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MATERIALS-HANDLING NEWS

★ Panel Discussions by Bassick, World's Largest Manufacturer of Casters and Floor Protection Equipment ★

Simple file test proves proper swivel bearing hardness



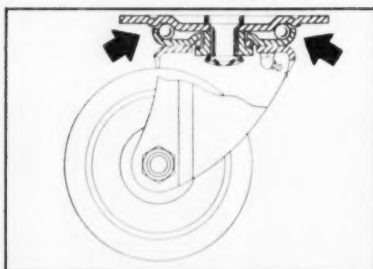
Hard? Filing action fails to cut uniformly hard (15N90 Rockwell) bearing raceway surface — showing you get *more-for-the-money* service life when you specify Bassick double ball-bearing cold-formed steel casters.

File-hard bearing surfaces

Bassick's deep full case-hardening process employs Leeds & Northrup electrically controlled "Homocarb" furnaces to assure "file-hard" ball and raceway surfaces of uniform depth and value of hardness. This eliminates premature wear or failure of these vital swivel bearing parts of all cold-formed double ball-bearing steel casters.

Try this simple file test in comparing the caster you are now using with a Bassick cold-formed double ball-bearing steel caster (series H99, S99, 68, H68, etc.). More-for-the-money service life is assured since Bassick's "file-hard" bearing surfaces are highly resistant to wear or damage.

Cross-section shows location of case-hardened parts



All surfaces of swivel bearing parts are full case-hardened *all over* — note heavy lines. Unlike so-called "coin-hardening" or its synonym "work-hardening", which reflects only a change in metal density as a by-product of cold forming metal processes, Bassick's controlled hardening process after forming provides completely uniform hardness depth and "file-hard" (15N90 Rockwell hardness) surface value.

Full case-hardened and cupped raceways give you longer service



On light-duty trucks and dollies, series "68" caster gives easy action. Load ratings up to 800 lbs. per truck.

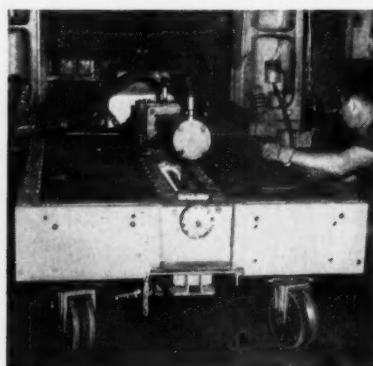


Shop trucks and mobile equipment move easier on new low-cost series "H68" caster for loads up to 1400 lbs.



For medium and light-duty jobs, use rugged series "H99" caster with load ratings up to 4000 lbs. per truck.

No "man-handling" here



Tired of wrestling with heavy dies?

Take a tip from Fairchild Aircraft, which built this hydraulic die wagon and equipped it with Bassick grooved-wheel casters. They're the best solution yet to the problem of moving materials frequently over a fixed route.

Accurate Control

This ingenious wagon employs hydraulic power to place and remove press dies. It completely eliminates laborious man-handling with the help of chain falls and skids. Bassick grooved-wheel casters permit accurate control of wagon, make movement 3 times easier than flat wheels in direct contact with floor. They roll on easily installed angle iron track which is inexpensive and self-cleaning. They're made in both swivel and rigid types, with wheel diameters of 4", 6", 8" and 10".

Write for facts

We'll be glad to supply more data on the Bassick products you see here. Bassick makes the world's largest line of casters, assuring you the right type for any moving job. Check your Bassick industrial distributor or write us direct.



THE BASSICK
COMPANY
Bridgeport 2, Conn.

In Canada:
Belleville, Ont.

Bassick

A DIVISION OF

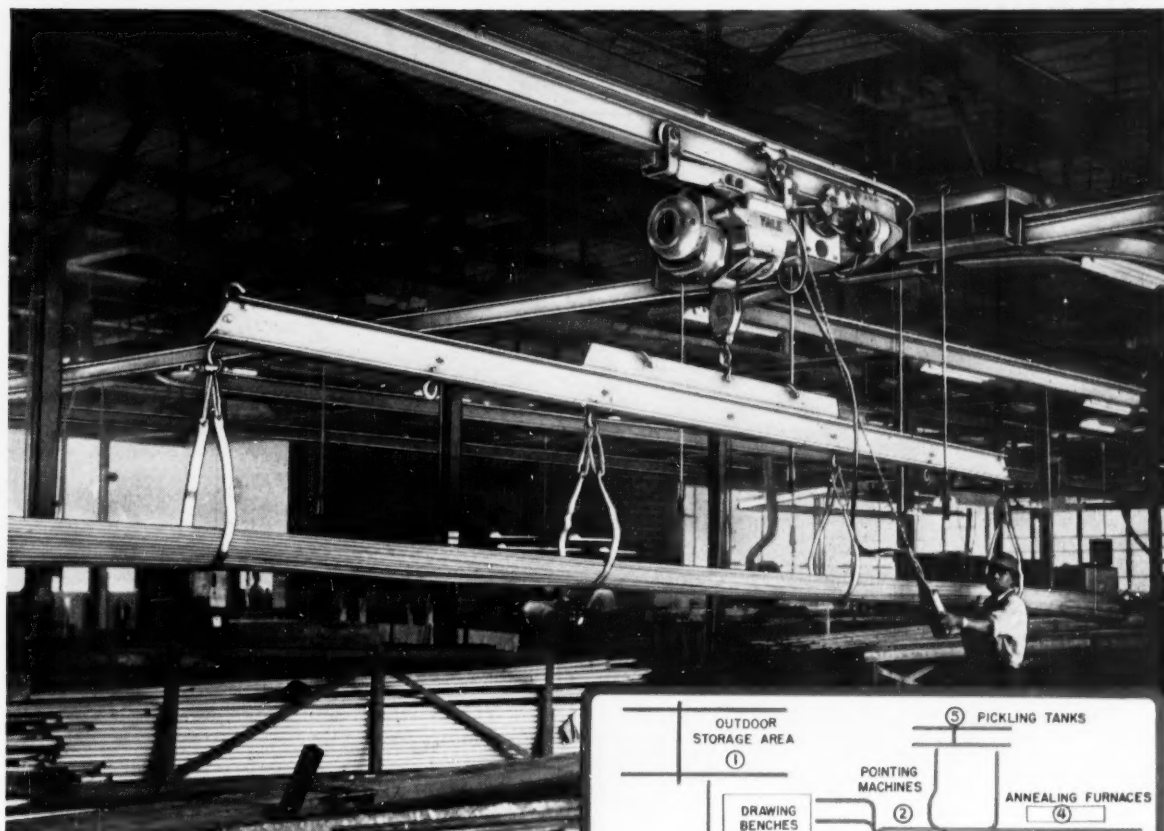


MAKING MORE KINDS OF CASTERS... MAKING CASTERS DO MORE

75 YEARS OF CASTER LEADERSHIP

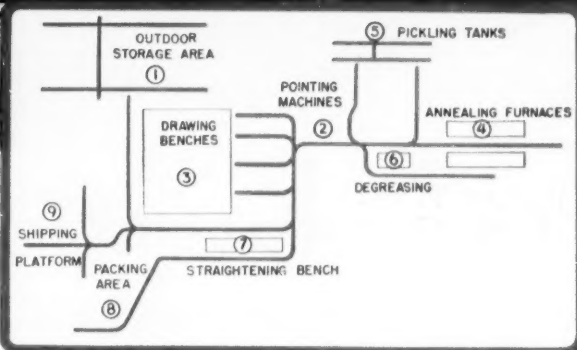
Circle No. 16 on Reader Service Card for more information

You can do it better with Louden engineered monorail!



Hard-to-handle materials or shapes? Let Louden's long experience lick it.

Louden pioneered monorail handling. This longest and broadest experience with this most adaptable and most flexible of all materials handling methods naturally offers many *extra* benefits to men seeking answers to any handling problems. Shown above is part of a Louden SuperTrack System in a well-known eastern factory where a Louden MotoVeyor makes easy work of the speedy handling of long, flexible, easily-damaged tubing. The hoist has 2,000 pounds capacity and the MotoVeyor travels at 125 feet per minute. This Louden Monorail System



also connects with the pickling house where a Louden Monorail Crane speedily and safely handles various sizes of tubing through the series of vats. Benefit by Louden experience on YOUR next handling problem.

THE LOUDEN MACHINERY COMPANY
4301 Broadway, Fairfield, Ia.

Louden

MONORAIL & CRANES



SEND FOR THIS BOOK—
Write for your copy of "Economical Material Handling" ... full of time-saving, cost-cutting ideas and case histories. Free ... no obligation.

Since 1867—the first name in materials handling

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NEWS VIEWS TRENDS

EQUIPMENT LEASING PLAN FREES WORKING CAPITAL

Clark Equipment Co. has established a low-cost equipment leasing program to operate through its dealers on a national basis, according to a recent announcement by W. E. Schirmer, vice president. Financial arrangements for the program have been worked out with the Harris Trust & Savings Bank of Chicago. While the program is not intended to promote leasing of equipment in preference to outright purchase, it is being offered as a service to that segment of industry which has a need for a low-cost leasing arrangement to free its working capital.

ILLINOIS TECH ANNOUNCES COURSE

Dr. Gerald J. Machett, director of the new National Center of Education at the Illinois Institute of Technology, has announced its first lectureship appointment. Raymond R. Mayer, former organization and methods analyst with the Ford Motor Co., will conduct a graduate course in engineering economics and will assist in the development of other educational-research activities at the center. The purpose of the center is to promote knowledge, understanding and application of methods of capital equipment acquisition and replacement.

BIGGER PLANTS NEED WIDER CRANE SPANS

The construction of a new 20,000 square foot factory building has been started in Detroit by the Northern Engineering Works for the manufacture of its overhead electric traveling cranes. W. W. Peattie, company president, pointed out that the trend toward wider, uninterrupted bays in modern plants has meant that overhead material handling equipment must be made heavier and of longer span to meet the wide range of operating requirements. His company also is expanding fabricating facilities throughout its plant to meet the call for bigger and more versatile overhead cranes.

WISCONSIN MOTOR ACQUIRES NEW PLANT

Wisconsin Motor Corporation has announced the purchase of a plant formerly occupied by Sterling Motor Truck Company, which was absorbed by White Motor Company who subsequently moved the Sterling operation to Cleveland. The new plant will provide facilities for a 60 percent increase in production.

NEW COMPANY

The Gruen Equipment Company, Inc., has been formed to specialize in material handling equipment for industrial, commercial, wholesale and retail establishments. According to Robert D. Gruen, president, gravity and power belt conveyors, monorails and hoists, overhead cranes, pallets, skids, hand trucks and other allied products will be handled.



MONARCH *Mono-Cushions*

... CARRY THE LOADS OF INDUSTRY



YOUR NEAREST MONARCH TIRE DEALER is listed in the Yellow Pages under "Trucks-Industrial-Parts & Supplies" or "Tires-Industrial". If current directory does not have a listing, write direct for complete catalog and name of nearest dealer.



**THE
MONARCH
RUBBER COMPANY**

210 Lincoln Park • Hartville, Ohio
7-255 General Motors Bldg., Detroit 2, Mich.

**SPECIALISTS IN INDUSTRIAL SOLID TIRES
AND MOLDED MECHANICAL RUBBER GOODS**

1742-MR

Circle No. 105 on Reader Service Card for more information

TODAY . . . IN PLANTS OF ALL TYPES . . . fleets of materials handling trucks are setting new mileage and economy records on MONARCH Mono-Cushion tires. Developed to meet the need for a more durable, shock absorbing solid tire, Mono-Cushions are specified by original equipment manufacturers . . . as well as users . . . because of their dependability and performance.

A COMPLETE RANGE OF SIZES is available for either new or replacement service on all standard lift trucks. In addition, special-purpose Mono-Cushions for use in hazardous or unusually severe applications can be supplied on special order.

BRING YOUR SOLID TIRE PROBLEMS TO MONARCH . . . let our industrial tire specialists solve them for you. There is a MONARCH tire for every materials handling truck application.

WESTERN EDITION OF EXPO PLANNED

Plans for the West's first Plant Maintenance Show were revealed recently by Clapp & Poliak, exposition management firm, and a board of leading western industrialists as sponsors. The show is scheduled for the Pan Pacific Auditorium in Los Angeles, July 13-15, next year. Similar to the East's program, a Plant Maintenance Conference will be held concurrently with the show. It will underscore the specialized problems of maintenance and engineering faced by western industry which has undergone tremendous expansion since World War II.

NAME CHANGE

The name of Six Wheels, Inc., has been changed to The Maxi Corporation. The trade name "Maxi" has long identified the company's products and, consequently, its inclusion in the name of the company was deemed desirable. The Maxi Corporation will continue all manufacturing operations of the company, and will handle the sales of crane carriers and related parts. The sales of tandem units, winches, and other automotive equipment will be handled by an affiliated company, recently organized, which has assumed the name of Six Wheels, Inc.

OLIVER, S-A TO TEAM UP

The Oliver Corporation announced, through its Farquhar Division, the completion of a manufacturing and merchandising agreement with the Stephens-Adamson Manufacturing Co. of Canada Limited. Under the terms of the agreement, Stephens-Adamson will manufacture and sell Farquhar conveyors in Canada. The conveyors will be manufactured according to the Farquhar Division specifications and will be sold under the trade name of Farquhar. In addition, Stephens-Adamson will maintain, through sales agencies, a supply of service parts.

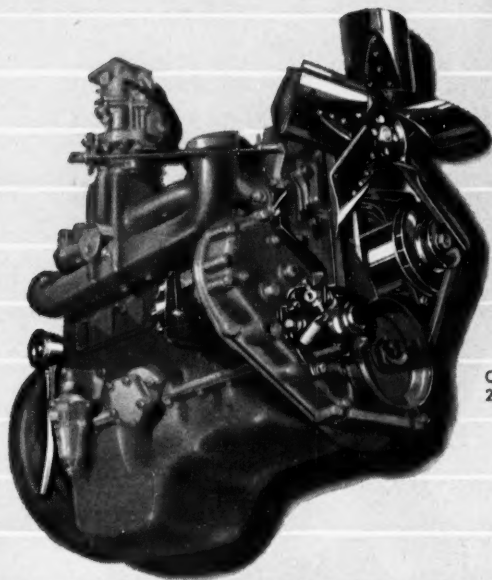
MAINTENANCE SHOW ADVISORY BOARD NAMED

Eleven executives, drawn from more than 300 companies, have been named to an Exhibitors Advisory Board for the Plant Maintenance & Engineering Show, which will be held at the International Amphitheatre, Chicago, January 25 to 28. The board will serve in an advisory capacity to determine policies to make the show more useful to visitors and to suggest the scope of the Plant Maintenance & Engineering Conference, which will be held at the Conrad Hilton Hotel concurrently with the show.

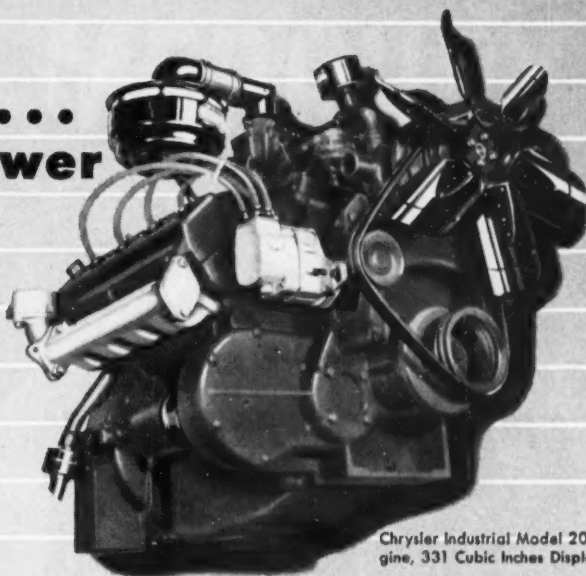
GOODYEAR ON RESEARCH TEAM

Goodyear Aircraft Corporation is one of eight universities and 11 industrial organizations forming a research and development team operating under the technical supervision of the Applied Physics Laboratory of The Johns Hopkins University. As an associate contractor, Goodyear is pooling its scientific minds, organizational talents, experience and facilities with 18 other members of the research and development team to accelerate the progress of the government's guided missile program.

**For greater PAY
in your PAYloads...
specify *CHRYSLER* power**

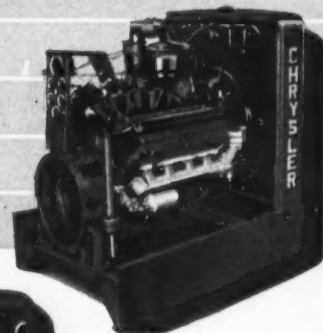


Chrysler Industrial Model 16 Engine,
265 Cubic Inches Displacement.



Chrysler Industrial Model 20 V-8 En-
gine, 331 Cubic Inches Displacement.

Chrysler Open Power Units include the complete engine, skid base, radiator and grille, instruments and instrument panel, flywheel and flywheel housing. (Pictured is V-8 Open Power Unit, which also includes a twenty-five gallon fuel tank.)



There are ten Chrysler Industrial Engines and Power Units, from 217 cubic inches to 413 cubic inches displacement. All of them operate with gasoline, natural gas or L-P gas fuels.

True to the Chrysler tradition, these engines, both In-line 6 and V-8, are among the most advanced design, best engineered and most powerful engines available today in their power ranges. Yet, thanks to famed Chrysler Research, they are constructed of lightweight, highly alloyed steels and allow amazing horsepower to weight ratios.

They are, therefore, ideal engines for most any equipment, regardless of size or silhouette. Let our nearest dealer give you more details, you'll be agreeably surprised to know how inexpensive Chrysler Power—equipped to meet your specifications—is . . . that's because Chrysler production facilities and manufacturing know-how allow us to custom-equip engines and make them available at mass-production prices.

Install Chrysler with confidence. Our nationwide dealer organization assures you good service and fast parts availability. If you prefer, write us: **Dept. 201, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.**

CHRYSLER
Industrial Engines

HORSEPOWER



WITH A PEDIGREE

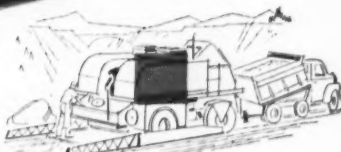


Chrysler Enclosed Power Units have the complete engine, instruments, instrument panel, skid base, fuel tank, radiator and grille, as well as fully enclosing sheet metal—side panels and hood top panel.

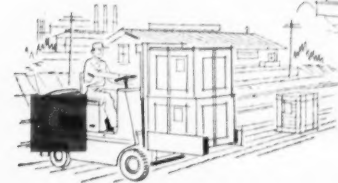
Street Paving Machine—
powered with Chrysler
Industrial Engine.



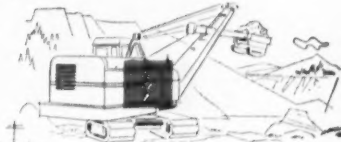
Farm Combine—
powered with Chrysler
Industrial Engine.



One-Half Yard Shovel—
powered with Chrysler
Industrial Engine.



Fork Truck—
powered with Chrysler
Industrial Engine.

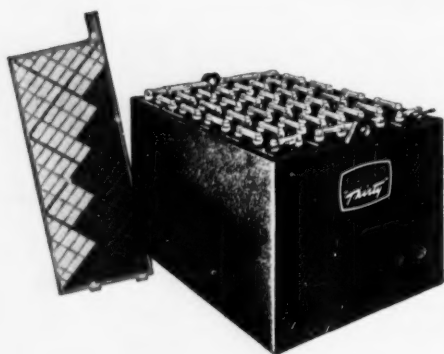


Circle No. 43 on Reader Service Card for more information

HIGH-LEVEL PERFORMANCE

THANKS TO BATTERY POWER!

Use battery-power for your industrial trucks and you've got high-level performance for low-cost handling. Today's trucks give you the higher lifts, shorter turns, faster maneuverability and greater adaptability necessary to meet modern handling needs. Only battery trucks are silent, safe, and fume-free. And, remember, there's *no* battery power like *Gould* power. *Insist on Gould!*



Specify
THE GOULD "THIRTY"
with New Diamond "Z" Grids—
America's Finest
Industrial Truck Battery



GOULD INDUSTRIAL BATTERIES

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, N. J.

Always Use Gould-National Automobile and Truck Batteries
Circle No. 64 on Reader Service Card for more information

©1953 Gould-National Batteries, Inc.

FLOW • JANUARY, 1954

New

MERCURY INDUSTRIAL TRACTORS

Here it is...the completely new MERCURY "Banty." A small, rugged 4 wheel gasoline tractor with a turning radius of only 62". Features new double reduction drive axle with demountable wheel rim and tire assemblies...self-energizing hydraulic brakes...new semi-elliptic spring suspension, front and rear...cushion or pneumatic tires...all-new automotive type steering plus many other unusual features.



Model 460

"Banty" (Gas Powered)

Available in Two Capacities:
2300 and 3000 lbs. DBP.



Model 550

"Tug" (Battery Powered)

Available in Two Capacities:
2000 and 2500 lbs. DBP.

The compact, versatile, new MERCURY "Tug" electric tractor. Features *automotive type steering*...4-speed magnetic contactor control with timed acceleration and controlled plugging...new type double reduction drive with demountable wheel rim and tire assemblies...self-energizing hydraulic brakes and new type semi-elliptic spring suspension. Available in twin-3 wheel, or 4 wheel model with wide front tread.

MERCURY

FORK TRUCKS · TRACTORS · TRAILERS

Over 41 years experience in the manufacturing, designing, and installation of material handling equipment.

MERCURY MANUFACTURING COMPANY
4154 S. HALSTED ST., CHICAGO

GENTLEMEN: Please send me information on the following:

- ☐ "Banty" Tractor Model 460
- ☐ "Tug" Tractor Model 550
- ☐ Both "Banty" Model 460 and "Tug" Model 550

NAME _____

COMPANY _____

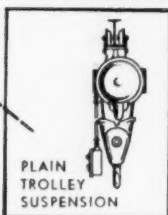
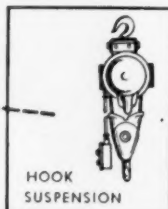
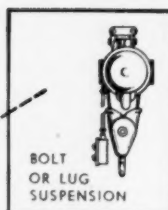
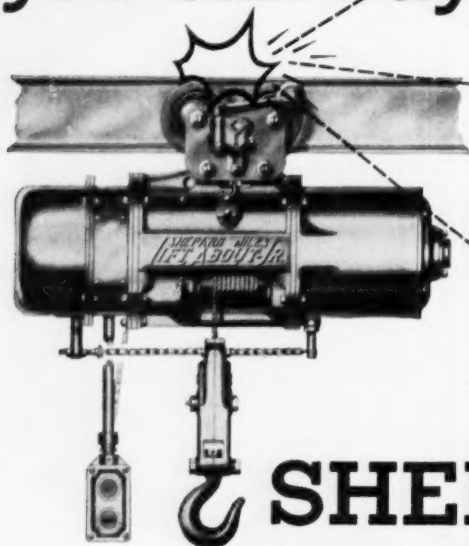
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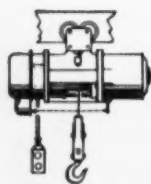
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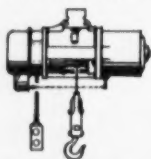
TOUGHEST *Light-Service* HOIST you can buy!



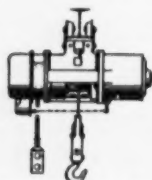
SHEPARD NILES *LIFT ABOUT-Jr.*



500 T Parallel or Cross Mounted.
Cap. 500 lbs. at 25 F.P.M. (A.C.)



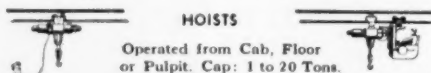
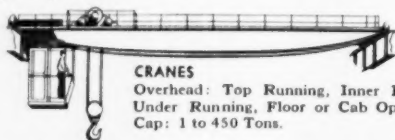
1000 J Parallel or Cross Mounted.
Cap. 1000 lbs. at 20 F.P.M. (A.C.)



2000 M Parallel or Cross Mounted.
Cap. 2000 lbs. at 20 F.P.M. (A.C.)

Hook your load to a Lift About-Jr.—it's the toughest light-service hoist you can buy. This rugged Shepard Niles Hoist is ideal for a hundred-and-one lifting jobs, guarantees you years of dependable service. It offers trouble-free wire rope hoisting, either rope or push-button operation.

Let a Shepard Niles representative tell you about the complete Lift About-Jr. line. He'll help you select the hoist with the right capacity and controls for your job.



SHEPARD NILES Crane and Hoist Corporation
2746 Schuyler Ave., Montour Falls, N.Y.

- () Please send me your new Lift About-Jr. Bulletin.
() Please have a representative call.

NAME _____ TITLE _____
COMPANY _____
STREET _____
CITY _____ STATE _____

**MAIL
COUPON!**

Circle No. 128 on Reader Service Card for more information

**news from the
SALES FIELD**

The appointment of St. Louis Railway Supply Co. as distributor of Baker-Raulang industrial trucks and cranes to railroads in the St. Louis area has been announced by Baker vice president G. B. Davis. Headed by Robert M. Close, the new dealer organization will offer complete sales, service and material handling consulting facilities throughout that midwest rail terminus.

John V. McHugh, long identified in the material handling industry, has been appointed to represent the Market Forge Co. in southwestern Pennsylvania. He previously had been manager of the Benkart Steel & Supply Co., material handling division, and had prior affiliations with the Pittsburgh Engineering & Machine Co., the Mesta Machine Co., and Minnitte Steel Co.



J. V. McHugh

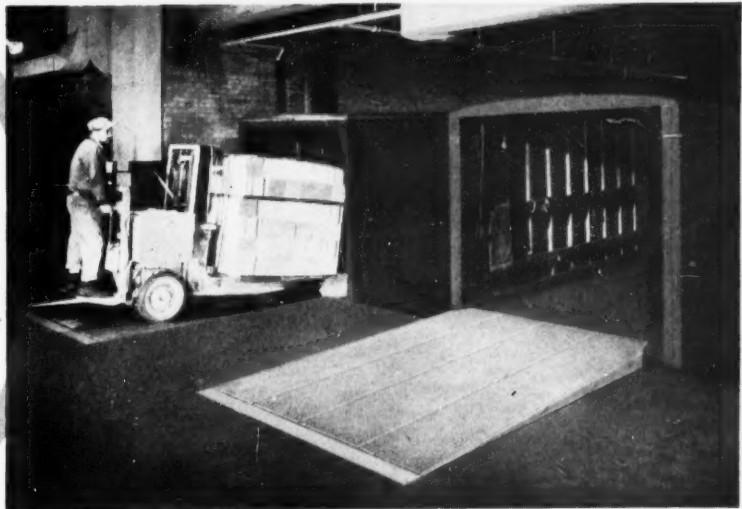
Easiquip Co., west coast material handling equipment manufacturer, has appointed the Material Handling Equipment Co., 141 East 44th St., New York City, as its exclusive sales representative for the metropolitan New York and northern New Jersey areas. The announcement was made by Jack Nelson, Easiquip manager. Lloyd H. Skoug, president and owner of the representative firm states he has five sales representatives servicing the territory.

(Continued on page 137)

You asked for it! Rotary's **NEW** Leva-Dock®

ADJUSTABLE HYDRAULIC RAMP FOR LOADING DOCKS

Low Cost
Simple Installation
Easy Maintenance
Assured Safety
4-way Leveling

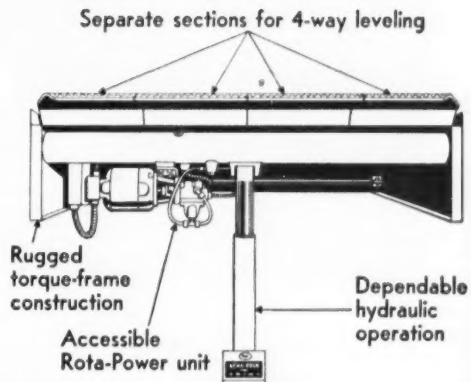


■ **Faster, Safer Loading**—Hundreds of material handling men were interviewed, thousands of loading docks checked before the new LEVA-DOCK was designed and engineered. It's Rotary's practical, economical answer to the loading dock problem.

This new automatic ramp compensates 4 ways for varying truck bed heights, out-of-level trucks, and truck spring deflection. Power trucks move quickly, safely in and out of trucks or trailers. A new automatic safety device prevents accidents and costly delays.

The Leva-Dock is a rugged, self-contained unit with oil reservoir mounted in torque-tube frame. All piping and wiring done at the factory except power leads and control wires. Installation costs are cut to the bone.

Mail the coupon and we'll show you how to make big savings at your loading dock.



Rotary®
LEVA-DOCK

MAIL FOR COMPLETE DATA

Rotary Lift Co., 1134 Kentucky, Memphis 2, Tenn.
 Send information on the LEVA-DOCK to:

Name.....
 Address.....

Circle No. 122 on Reader Service Card for more information

PRODUCTION RESUMED IN 3 DAYS

after \$1,000,000 fire at C&D Batteries, Inc.



C & D President, Leon A. Doughty pulls switch to start charging operations.



C & D's block-long plant in Conshohocken, Pa. at the height of the fire, Sunday, November 29.

Despite a \$1,000,000 fire that destroyed the main buildings, offices, engineering department, and laboratory of C & D's plant on Sunday, November 29, 1953, production was resumed in three days.

On Tuesday, December 1, space was leased in a nearby plant for setting up new production facilities. On Wednesday, December 2, new batteries that had escaped the fire were being charged on new lines, and grid casting was begun next morning.

The new facilities were in operation on December 10. The salvaged portions of the main plant and the leased facilities were combined to achieve full production by Christmas.

We thank our customers for their patience in bearing with us during delays in shipping, and assure them that the high quality of C & D products is being maintained. *We are deeply grateful to our many friends who have generously given us their kind understanding and support.*

Philadelphia Inquirer Photos

Two Men Seized in Bakery Holdup

Two holdup men were captured by police late last night, within 15 minutes after they robbed a bakery, on Dryum ave. near Oster st., of \$122.

The robbery occurred in Vern's Bakery, at 9718 Dryum Ave. The men were seized at the place at 10:35 P. M. The younger one held his hand in his coat pocket.

Auto Strikes Man Carrying Box

A man carrying a box was struck by an auto on 93rd st. near Duane. The man was taken to the hospital after the accident.

C&D BATTERIES, INC.

of Conshohocken, Pa.

SALES AND SERVICE OFFICES IN PRINCIPAL CITIES FROM COAST TO COAST

Circle No. 29 on Reader Service Card for more information

FLOW • JANUARY, 1954

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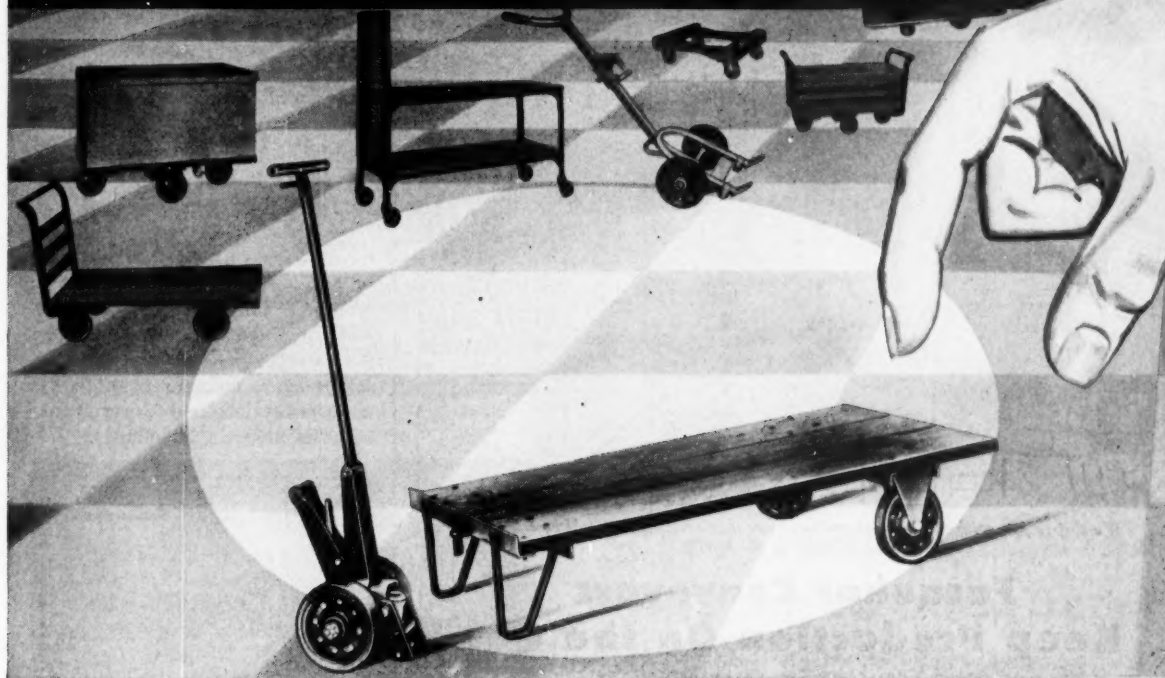
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When It's Your Move...



Do It For Less With All-Purpose Trucks

Cut handling costs to rock bottom by using COLSON Lift-Jack Systems in receiving, shipping, storage and production. Quality constructed, with wood or steel semi-live skids, they multiply manpower efficiency, speed production and save space.

Other *standard*, job-tested COLSON products include:

drum trucks, hand trucks, platform trucks, box trucks, and famous COLSON casters.

Let experienced COLSON engineers provide the money-saving solution to your *special* handling problems, too. Just write or check the yellow pages of your phone book (under "Casters" or "Trucks, Industrial") for the COLSON office nearest you.

Mail Coupon Today

THE COLSON CORPORATION
ELYRIA, OHIO

Please send free catalog on
"Colson Trucks and Casters"

Name

Position

Company

Address

City

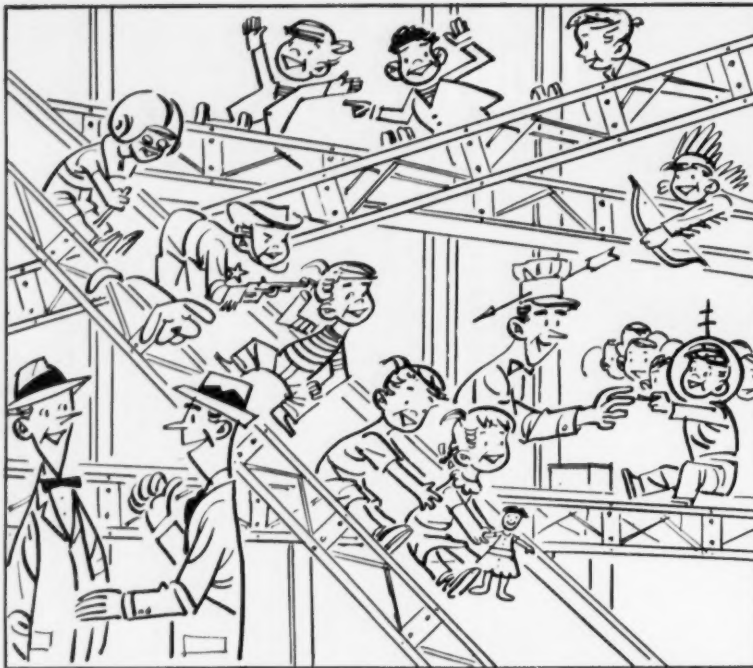
Zone State

The COLSON Corporation

ELYRIA, OHIO

CASTERS • LIFT JACK SYSTEMS • INDUSTRIAL TRUCKS

Circle No. 36 on Reader Service Card for more information



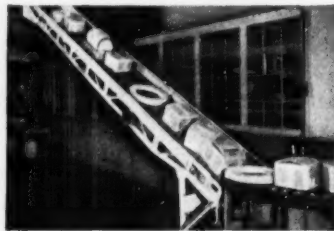
We ship so fast with our Farquhar Conveyors that production can't keep up! So we sell rides to the kids!

Farquhar Conveyors Keep Production On the Go!

We don't suggest that you'll be using Farquhar conveyors to give rides to children, but we do claim that our conveyors will save you time, money and labor on your production line, in your shipping department, and in all your materials handling operations. What's more, we can *prove* it! Not just with paper and pencil, but with actual results in operations like yours all over the country! Testimonials in our files (some of which are described in the free booklet offered below) from every type of business imaginable, prove Farquhar conveyors work better, give longer, more trouble-free service and pay for themselves in operation, many times over!

Whether you move bulk or packaged materials—horizontally or from floor to floor—Farquhar can cut *your* handling costs to rock bottom. Probably your problem can be solved by one or more of Farquhar's "standard"

portable, semi-permanent or permanent power-belt and gravity conveyors. On the other hand, where a specialized system is called for, our engineers will be glad to work with you . . . at no obligation, of course. Find out how Farquhar can help you—a note on your letterhead will bring one of our men on the run.



Typical packaged materials handling installation. Farquhar conveyors stack, pile, store or move materials faster and easier—cut all your handling costs to the bone.

OLIVER

**Farquhar
CONVEYORS**

FREE!

"Owners Report"—a booklet of case histories of money-saving conveyor installations.

MAIL COUPON FOR YOUR COPY

THE OLIVER CORPORATION
A. B. FARQUHAR DIVISION
Conveyor Dept. J-06, York, Pa.

**POWER-BELT
AND
GRAVITY
CONVEYORS**

Gentlemen:
Please send me my free copy of "Owners Report."

Name

Firm

Address

City

Zone

State

Circle No. 57 on Reader Service Card for more information

HIGHLIGHTS of the month's NEWS

THE LATEST in a continuing series of Joint-Industry Conferences, this one sponsored by The Materials Management Center of Wayne University and General Motors Corp., was held last month in Detroit. Approximately 250 representatives from major industrial firms, packaging laboratories, manufacturers of packaging materials and Government agencies were in attendance.

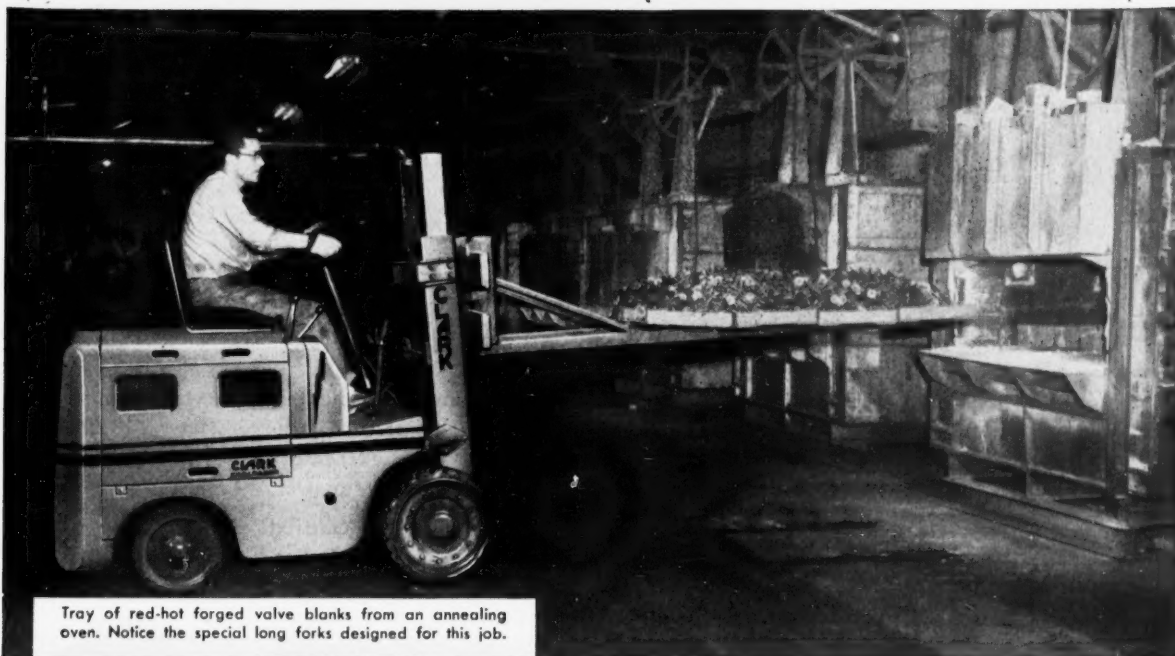
Flow '53 Index Available

Reprints of the index listing all feature articles printed in FLOW during 1953 are available at no charge to readers. The index is fully cross-referenced as to subject matter and types of equipment employed in all types of handling operations. All that is necessary is for you to write a brief request to the editors.

It was a full two-day affair devoted to "Cushioning in Packing", with mix-it-up discussions in which everyone, audience and speakers alike, were urged to participate. Several outstanding papers were presented on the subject of determining proper kinds and amounts of cushioning for any product to be packaged. In addition, speakers discussed instrumentation in packaging, and specific features of many individual types of cushioning materials.

In general, the flow of information from speakers and among conferees was lively and informative. The conference provided packaging people with a fine opportunity and provided workable answers to many previously unsolved problems.

(Continued on page 94)



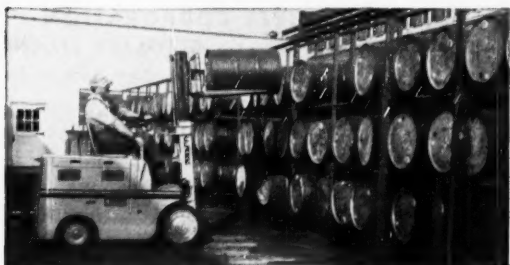
Tray of red-hot forged valve blanks from an annealing oven. Notice the special long forks designed for this job.



Weighing load of slugs to determine number of pieces produced. Tote boxes have weight marked on side.



Double duty: the tireless Clark handles a palletized load for shipment, tows trailer-loads of scrap.



Storing and handling of coolant and lubricants ceased to be a problem when the Clark took over.

From rough slugs for forging to palletized loads for shipment—**EATON VALVES** are **CLARK-handled**

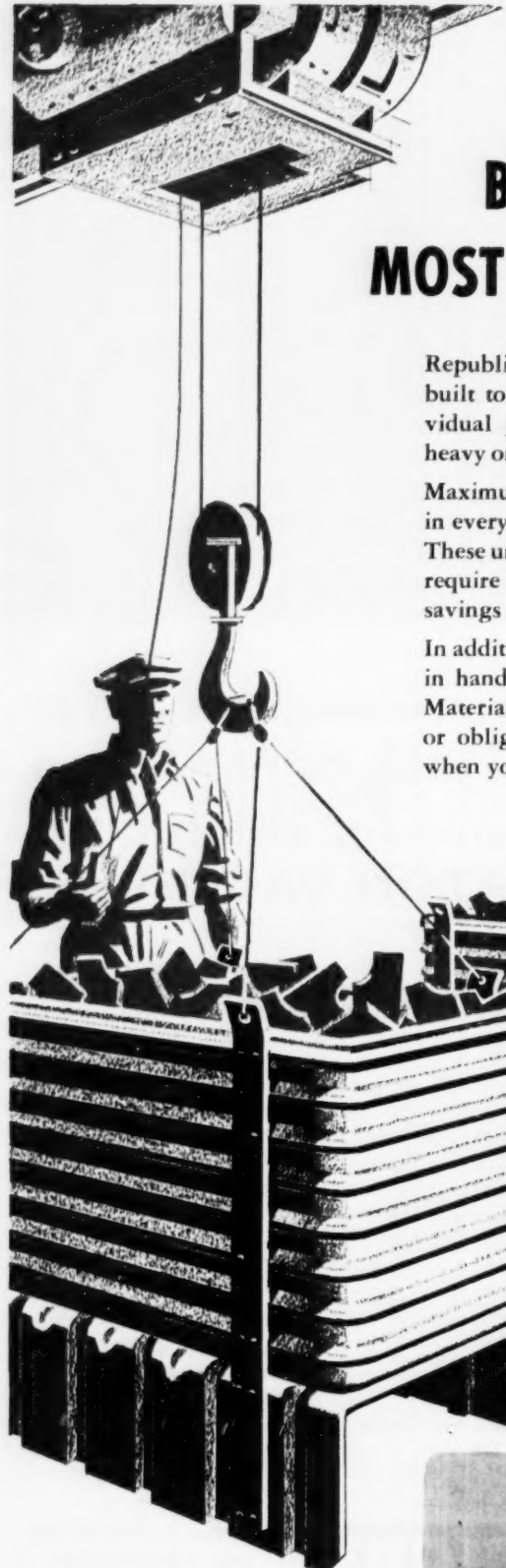
"Our Clarks do more jobs than any equipment in the plant," say production men of the Eaton Valve Division. 750,000 motor valves per week—different sizes, shapes, material and finishes—must be handled on schedules carefully synchronized for uninterrupted production. Eaton depends on its 4000 lb. Clark electrics to do the job smoothly, efficiently. In addition, they utilize their Clark trucks to handle drums of lubricants and coolants, haul scrap, do plant-maintenance work. They cut handling costs *throughout* the plant—not merely on the production line.

The wise way to find out where and how your own handling costs can be cut is to talk it over with your Clark dealer. He's listed in the Yellow Pages—call him now.

**CLARK
EQUIPMENT**

Industrial Truck Division
**CLARK EQUIPMENT
COMPANY**
Battle Creek 13,
Michigan

Circle No. 44 on Reader Service Card for more information

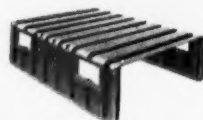


BUILT FOR THE MOST RUGGED HANDLING JOBS

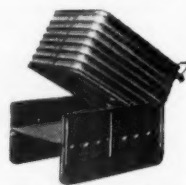
Republic Materials Handling Equipment is built to meet the requirements of each individual job. For handling your extremely heavy or light loads, Republic has the answer.

Maximum strength and rigidity are featured in every Republic Steel Box, Skid and Pallet. These units speed production, save floor space, require minimum maintenance and produce savings in all phases of materials handling.

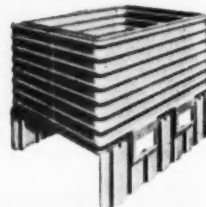
In addition, many plants have effected savings in handling costs by consulting a Republic Materials Handling Engineer. There is no cost or obligation for this service. Let us know when you would like him to visit your plant.



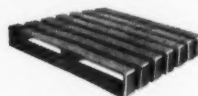
P-3-FHR Skid with
Four-way Entry



PB-125 Dump Type
Box and Skid Unit



PB-650 Box and Skid Unit
with Sliding End Door



P-14 Double-face
Steel Pallet

PRESSED STEEL DIVISION

REPUBLIC STEEL CORPORATION

6202 TRUSCON AVENUE • CLEVELAND 27, OHIO

Export Department: Chrysler Building, New York 17, N. Y.

Republic
MATERIALS HANDLING EQUIPMENT



Circle No. 125 on Reader Service Card for more information

FLOW • JANUARY, 1954

Date Set For 6th National Material Handling Expo

The members of the Material Handling Institute have voted to hold the next Material Handling Exposition in Chicago in 1956. A poll of members attending the annual meeting in New York, Dec. 14 and 15, showed that 66% favored the new three-year plan. (Shows will be held every three years instead of every two as in the past). The members also voted to make the exposition a four-day show instead of the previous five-day show. There will be one evening session.

• • •

I.T.A. Elects New Officers

The Industrial Truck Association held its annual meeting in New York on Dec. 16, for the election of officers. Elected were: C. W. Henkle, president of Mercury Manufacturing Co., president; C. E. Smith, president of Towmotor Corp., vice-president; William Van C. Brandt, secretary and treasurer.

The association, commonly referred to as I.T.A., last year had sales approximating \$200,000,000. It is composed of manufacturers of electric and gasoline fork trucks, tractors, walkie trucks, storage batteries and chargers.

• • •

E.M.I. Contributes To Wayne U.

Another company has been added to the growing list of industrial firms contributing to the support of Wayne University's Material Management Center. Equipment Manufacturing Inc., presented the school with \$3000. at a recent material management Center evening meeting. Receiving the check for the Center was C. C. Whiteford, manager of training for Ford Motor Co., and Chairman of the Management Center's Industrial Planning Committee for Development.

This may be your winning combination!



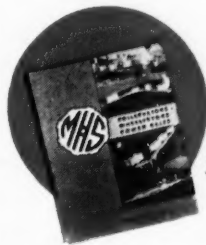
Automatic Materials handling with **MHS** STANDARD UNITS

**WHEELVEYORS
LIFTVEYORS
TRANSVEYORS
ROLLERVEYORS
JUNIOR MONOVEYORS
LIVE ROLLERS**

Here's a demonstration of the amazing versatility of MHS standard conveyor units—Transveyor, Liftveyor, and Junior Monoveyor combined with simple transfers to make an automatic materials handling system.

Conveyor units used are standard, ready to ship from stock, easy to install, economical to buy, rugged and dependable in operation. They are designed, engineered and built with the benefit of this company's 34 years' leadership in materials handling equipment.

MHS pre-engineered standard units can make big contributions to the efficiency, economy, productivity and competitive position of your organization. Better investigate!



Send for this FREE book

Bulletin PE-2, fully illustrated, with complete information on all types of MHS standard conveyor units. Write today!

Mechanical Handling Systems Inc.



4620 Nancy Ave., Detroit 12, Michigan

Offices in Principal Cities

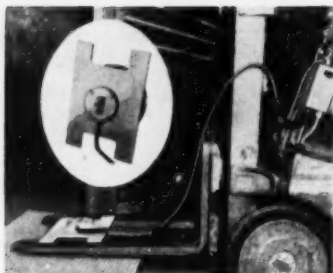
In Canada: Canadian Mechanical Handling Systems Ltd., Toronto

Circle No. 96 on Reader Service Card for more information



in Equipment

Summaries of latest information from manufacturers. For more details, use the free-mailing Reader Service Card.



Magnet Handles Dock Boards

Designed to rest on the forks of a lift truck, a magnet has been developed by Cutler-Hammer, Inc., to handle dock boards, which may weigh as much as 900 lbs. Current is supplied from any 32 or 36 volt battery of electric trucks, or from the 6 volt generator and battery normally used for lights on gasoline operated trucks. Twelve inches in diameter, the magnet is suspended between forks held in place by a frame resting on them. When not in use, it may be carried on the rear deck of the truck.

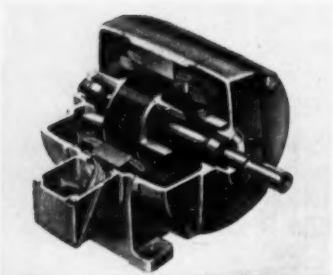
Circle No. 252 on Reader Service Card for more information



Heavy Duty Casters

A new line of "Super-forged" steel casters, produced by Thomas Truck and Caster Co., has top and bottom plates of forged steel with all parts over-size. It will be available in 5, 6 and 8 in. wheel sizes, with molded-on rubber tired, roller bearing wheels, or malleable iron machined face roller bearing wheels. Swivel fork and wheel are both equipped with screw-type Alemite lubrication fittings. Caster load bearing is self-contained with hardened and ground raceways. Thrust bearing is of tapered type, held by adjustable lock nut.

Circle No. 253 on Reader Service Card for more information



High Efficiency Polyphase Motor

Intended for use wherever a polyphase induction motor is required, a new line of General Electric motors is designed for higher full-load speeds, quieter operation and longer life with reduced maintenance. Called "Tri-Clad '55'", and shown in cutaway view, the line is built to latest NEMA frame dimensions—with average reductions in size of 50 percent by volume and in weight per horsepower of 22 percent. It retains cast-iron construction and incorporates a new insulation system, bearing assembly and ventilation plan.

Circle No. 254 on Reader Service Card for more information



Fork Truck Clamp for Hogshead.

A hydraulically actuated attachment for handling hogsheads has been made available by Mercury Manufacturing Co. for its line of fork trucks. It is said the unit can be installed in place of standard forks in a matter of minutes. The clamp picks up hogsheads resting horizontally in the floor without need for blocking or forward tilt. The clamp shown will handle a hogshead 48 in. in diameter, weighing up to 1500 lbs. Clamp attachments come in various diameters and weight capacities.

Circle No. 255 on Reader Service Card for more information

You can't compete if your equipment is obsolete!

With business conditions more competitive, it is more important than ever to analyze your production costs . . . your handling methods . . . your tools and equipment.

Obsolete methods and equipment take a heavy toll by slowing down production, increasing manhours and increasing repairs and maintenance. Material handling equipment in many plants is the key factor in efficient production — the pace setter for the entire plant. That is why it is so important to keep raw materials *on the move* in and out of the plant, to and from processing machinery — with the most modern, efficient methods and equipment.

If you are not using "PAYLOADER" Tractor-Shovels at present, it will pay you to investigate this fast, flexible, versatile system that is producing outstanding economies in all sizes of plants throughout the nation.



If your plant is already "PAY-LOADER"-equipped, you'll be pleasantly surprised at the superior performance of the late model "PAYLOADERS". Although "PAYLOADERS" are built for years and years of dependable ser-

vice, constant research and engineering improvements keep "PAYLOADERS" out in front in design, construction and performance.

Now is the time to trade in obsolete equipment — to gear your plant to present day conditions — to assure profitable operation on existing or slightly lower sales volume. Your nearby "PAYLOADER" Distributor will be glad to discuss your material handling methods and provide a demonstration of this equipment. For his name and address write The Frank G. Hough Co., 731 Sunnyside Avenue, Libertyville, Illinois.

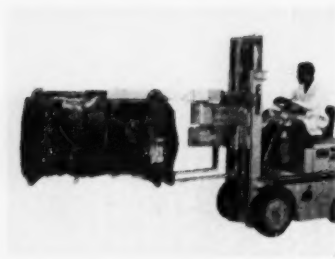


PAYLOADER®

THE FRANK G. HOUGH CO. • Since 1920



Circle No. 76 on Reader Service Card for more information



Swinging Clamp Attachment

A unit which can reach out to either side of a narrow aisle to grasp or tier loads behind material already stacked can be obtained for all Carloader models of fork trucks manufactured by Clark Equipment Co. Called a swinging clamp attachment, it has a full 180 deg. traverse. While it can also be adapted for heavier machines, maximum capacity for the attachment is 600 lbs. because of the side stability problem inherent in a long boom. A wide range of gripping reaches is available—either by hydraulic shift alone or combination hydraulic shift and manual adjustment of rear pad.

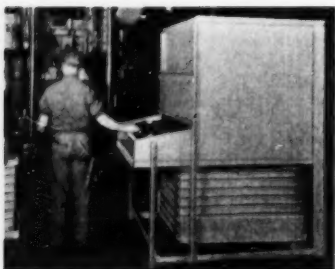
Circle No. 256 on Reader Service Card for more information



Indoor-Outdoor Hydraulic Crane

A new self-propelled crane by Austin Western Co. provides four basic functions—360 deg. turntable rotation, 24 ft. boom lift, raising and lowering of cable and hook, and power extension (to 24 ft. reach) and retraction of boom. All movements, including steering, are actuated by hydraulic power. Under full load it will negotiate grades to 20 percent, and travel at 15 mph. Rated capacity is 3200 lbs. at 18 ft. boom radius; 8000 lbs. at 10 ft. Overall crane height is 9 ft.; width, 8 ft. Equipment incorporates Cone-Drive gearsets and 750 rpm Vickers hydraulic motor.

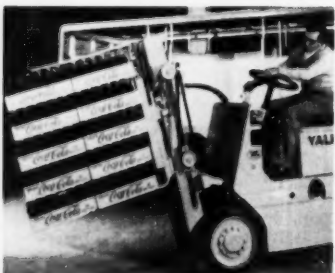
Circle No. 257 on Reader Service Card for more information



Work-Level Feeder

A portable, rugged hopper with a capacity of 47.2 cubic ft. is now produced by Union Metal Mfg. Co. to provide mass material supply at work-level position and increase vertical supply volume at work stations. Called the Work-O-Matic Gravity-Fed Hopper, it can be transported to different work stations by fork truck. Front legs of the hopper are set back under the tray to permit closer work-positioning. An adjustable, vertical control gate governs material flow according to piece size.

Circle No. 258 on Reader Service Card for more information



Fork Truck for Bottle Handling

A specially adapted fork truck of Yale & Towne manufacture has been designed for use with a new route truck for bottlers. The fork truck has a hydraulic side-shifter and load stabilizer. The latter consists of a metal pressure plate, covered with thick foam rubber, which grips cases firmly without marring bottle crowns. Front tilt and shift combine to make loading of the truck easy. The truck, cooperatively designed by several major bottling concerns and suppliers, has been placed at industry disposal by Coca Cola.

Circle No. 259 on Reader Service Card for more information



Handler, Positioner for Bar Stock

The "Portelvator", produced by Hamilton Tool Co., is for use in receiving heavy billets, transporting them to stock, moving them to sawing the machine, and positioning and feeding directly to the saw. Slots between rollers enable the chain of the overhead crane to be wrapped around billets more securely. Capacity of the table is 2000 lbs., vertical travel 14 in. Elevation is by hand crank from the side to permit extension of bar stock over ends. Minimum height from floor is 20 in., maximum 34 in. Table surface is 18x20 in.

Circle No. 260 on Reader Service Card for more information

(Continued on page 144)



Pallet type "Walkie" truck 4000 to 6000 lb. capacity.

Engineered

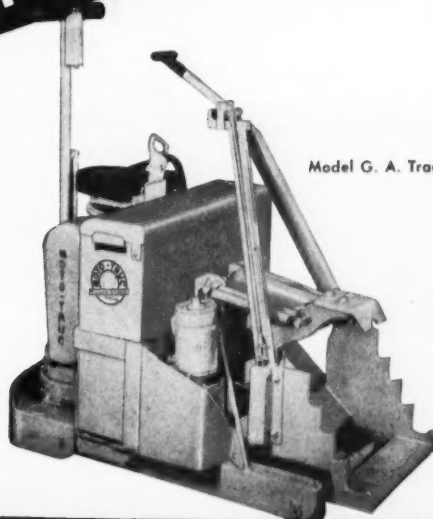
TO FIT YOUR JOB...

***CUSTOM BUILT OR...
...STANDARD MODELS**

Whether your materials handling job requires special applications or is adaptable to standard models, the cost is relatively the same.

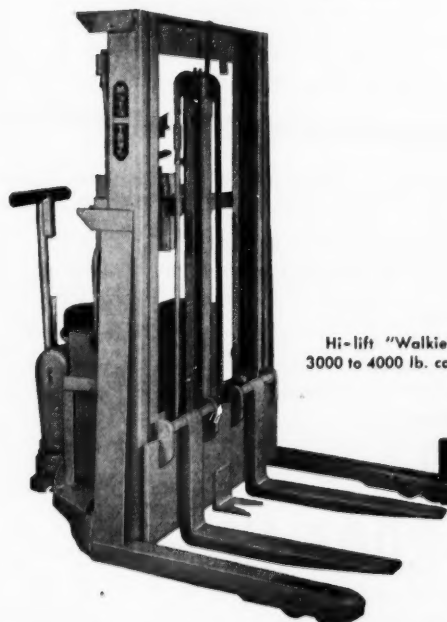
Our Engineers will welcome the opportunity to discuss YOUR particular material handling job . . . Moto-Truc's can be engineered to fit the job. Investigate their "Job application" offer in the economical "Walkie" type lift trucks. Your inquiry will receive prompt attention.

SEND FOR BULLETIN #53



Model G. A. Tractor.

... AT NO EXTRA COST*



Hi-lift "Walkie" type 3000 to 4000 lb. capacity.



Platform "Walkie" type 4000 to 10,000 lb. capacity.

Representatives in Principal Cities

The MOTO-TRUC Co

1925 E. 59th St. • Cleveland 3, Ohio
Pallet . . . Platform . . . Hi-Lift Trucks
LARGEST EXCLUSIVE MANUFACTURER
OF "WALKIES"



Circle No. 106 on Reader Service Card for more information

New!

VARY-TALLY

Multiple-Unit Reset Counter



DESIGNED TO COUNT ANYTHING COUNTABLE

this new Vary-Tally can be supplied in any combination up to 6 banks high, 12 units wide, with the counting units arranged compactly on stands in tiers. Now check these special features of Veeder-Root design and construction:

- Easily Readable from any Angle . . . Bold Figures Always Centered in Window . . . No Glare . . . Figures not Covered by Fingers in Operation
- Easily Portable, yet Ruggedly Built for Long Wear
- Separate Counting Units Can be Rotated like Tires on a Car, to Distribute Wear Evenly
- All Parts Corrosion-Resistant
- Working Parts of Hardened Steel
- Operation Not Affected by Extreme Heat or Cold
- Individual Tag Above Each Counter-Window — Not Strip Tabs
- Veeder-Root Quality in Every Part

Now what's on your mind, that Vary-Tally can help you count? Write for news sheet and prices.

'The Name that Counts'



VEEDER-ROOT INC.

HARTFORD 2, CONNECTICUT

Chicago 6, Ill. • New York 19, N. Y. • Greenville, S. C. • Montreal 2, Canada • Dundee, Scotland • Offices and Agents in Principal Cities

Circle No. 143 on Reader Service Card for more information

Look at all the features

that are built right into the

OMIC HAND PALLET TRUCK



Fast-acting hydraulic pump; full five-inch lift ensures smooth travel over rough, uneven surfaces.

Twin front wheels for high maneuverability.

Ball bearings fitted in all wheels and steering swivel.

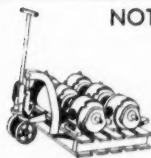
Overloading prevented by factory-set relief valve.

Hard chrome-faced rams and pump piston assure long life.

- Rubber or steel tires to suit customers' requirements.
- Quick and easy detachment of hydraulic unit for service or replacement.
- Controlled lowering speed.
- Pressed steel forks for high strength.
- Capacities—2,600 lb. and 4,000 lb.
- Fork lengths—36", 42", 48".
- Widths overall forks—20½", 27".

- Model illustrated, has been produced to meet universal demand for a pallet truck of high quality and modest cost. It is designed for the simplicity and strength that guarantee long life and trouble-free service.

NOTE THE VERSATILITY OF THE O.P.12



Handling pallet loads of heavy parts and components.



Unloading shipments from highway and rail trucks.



Easily maneuvered for maximum space utilization.



Ease of handling with full loads preventing bottlenecks.

American Representatives:

PALITON, INC.

40 WEST 29th ST., NEW YORK 1, N. Y.
Murray Hill 4-6531

Head Office:

OMIC, LTD.

9 GEORGE ST., LONDON, W1, ENGLAND

Circle No. 25 on Reader Service Card for more information

Literature

featured in this month's advertisements

Two bulletins are available from Silent Hoist & Crane Co. Bulletin No. 75 gives complete details on the Lift-O-Krane while bulletin No. 77 covers the company's Liftruk line.

Circle 153 on Reader Service Card

Descriptive literature on the Robo-Lift Bucket Elevating Conveyor and the Robo-Lift Tray Elevating Conveyor may be requested from the Counsel Machine Co., Inc.

Circle 39 on Reader Service Card

Full information may be obtained from the Revolver Co. on its portable Uplifter elevator. It is said to be both easy and inexpensive to operate. Two available models have capacities of 1000 and 2000 pounds.

Circle 124 on Reader Service Card

Answers to almost any shipping or packing problem may be obtained from Acme Steel Co. whose engineers always are ready to serve industry with their years of experience. Complete literature is available.

Circle 14 on Reader Service Card

Literature concerning its free layout and engineering service may be obtained from Easiquip Co. The company's system provides a sound solution to satisfactory warehousing of roll goods, especially where portions of the rolls must be removed periodically from inventory.

Circle 54 on Reader Service Card

Information telling how you can stop profit leaks by cutting handling costs on your loading dock is contained in literature available from Karl A. Hernan Co.

Circle 69 on Reader Service Card

Full particulars on the Unitized Narrow Belt Conveyors are contained in a booklet available from the Island Equipment Co. Belt widths are available from one to six inches for handling small products and light weight containers.

Circle 80 on Reader Service Card

Free samples, test data and complete information may be obtained from Mid-States Gummed Paper Co. covering its Green Core Barrier Wrap material. It is said to meet latest government packaging requirements in safeguarding against rust and other moisture damage.

Circle 100 on Reader Service Card

A new 16-page catalog may be requested from Michna Systems providing complete details, illustrations and installation instructions for building your own overhead conveyor from Un-O-Veyor standard parts.

Circle 98 on Reader Service Card

Complete information on the Leva-Dock may be obtained from the Rotary Lift Co. Features are said to include low cost, simple installation, easy maintenance and assured safety 4-way leveling.

Circle 122 on Reader Service Card

How to provide easy mobility to a variety of industry products is explained in literature available from Ironbound Box & Lumber Co. The firm manufactures a wide line of floor trucks, dollies and skids.

Circle 154 on Reader Service Card

On-The-Job data is available from the Prime-Mover Co. showing the various applications in which the Prime-Mover $\frac{3}{4}$ -ton unit can bring about wide savings in construction fields and numerous other bulk material handling uses.

Circle 112 on Reader Service Card

Literature about a new time-saving tool for separating ferrous and non-ferrous small metal parts has been released by Magnetool Division of Multifinish Mfg. Co. The permanent type magnet is non-electric, requiring no batteries. Simple finger control sets it for pick-up of fast release.

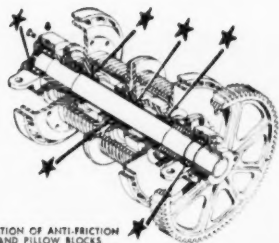
Circle 103 on Reader Service Card

If you're looking for additional storage space in your warehouse literature obtainable from Powell Pressed Steel Co. may prove helpful in modernizing your bulk storage and inventory.

Circle 113 on Reader Service Card

Comparison figures and other pertinent data is available from Baldwin-Lima-Hamilton Corp. showing how its line of shovels, cranes and draglines stack up alongside similar equipment.

Circle 152 on Reader Service Card



STARS INDICATE LOCATION OF ANTI-FRICTION BEARINGS IN DRUMS AND PILLOW BLOCKS

LIMA'S

shafts and drums roll on anti-friction bearings



This LIMA 34-M is shown here at work at the Southwark Station of the Philadelphia Electric Company where it is used constantly as a general yard crane as well as a clamshell for unloading coal from a hopper into railroad cars.

As a result of twenty-five years' experience with anti-friction bearings, Lima design engineers know exactly where to put them to give you maximum benefits. This cut away view shows how Lima utilizes anti-friction bearings in the drums X-ray vision would show you how Lima uses them throughout the main machinery on all shafts and other important parts.

This modern means of eliminating destructive friction benefits LIMA owners through faster operating speeds and lower upkeep. Anti-friction bearings also maintain perfect shaft alignment and insures smoother, easier clutch action.

COMPARE! No other machine gives you as much as LIMA!

1. Mounted on wheels for greater speed and mobility from one yard assignment to another.
2. Anti-friction bearings, used at all important bearing points, reduce destructive friction, fuel consumption and lubrication requirements.
3. All gears, smaller parts and shafts which are subject to extra wear are flame or induction hardened for longer life.
4. Main machinery is placed well back of center of rotation to eliminate excess counterweight.
5. Propel and swing gears and power take-off are enclosed in a sealed oil bath for dirt elimination and smoother, quieter operation.
6. Big capacity drums and sheaves lengthen cable life by reducing the need for double wrapping and sharp bends in cable.
7. Torque converter (optional) automatically adjusts speed to load requirements, minimizing shock loading, making performance smoother and faster.
8. Wherever you are you can depend on skilled service and nearby warehouse stocks of parts to keep your LIMA on the job continuously.

COMPARE and you'll specify LIMA for shovels ($\frac{3}{4}$ yd. to 6 yd.), cranes (to 110 tons) and draglines (variable).

DISTRIBUTORS IN ALL PRINCIPAL CITIES OF THE WORLD

LIMA
SHOVELS • CRANES
DRAGLINES • PULLSHOVELS



BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

Construction Equipment Division

Circle No. 152 on Reader Service Card for more information



Wheeled Hydraulic "Packages" Move Snow at Low Equipment Cost

Snow removal is a non-productive *must* that taxes any budget. That's why faster, more efficient snow handling systems are constantly being sought. MM Wheelers have proved a low-cost answer to snow removal problems because they mount a wide choice of snow handling equipment on the same basic materials-handling machine used the year around.

For big capacity loading, the heavy regular material bucket can be replaced with a lighter and extremely large snow bucket. For plowing, either V-type or rotary plows can be mounted. For other jobs, fluid drive sweepers are the most economical and efficient equipment.

High road speeds enable Wheelers to cover ground fast. Short turning radius and hydraulic control of snow handling attachments permit fast, easy operation in close quarters. When windrowed snow

must be loaded without blocking traffic lanes, recently-developed side-dump buckets are an effective solution. All-weather cabs are available to permit operation under any weather conditions.

While snow handling is an off-season job, it will pay to consider Wheeler advantages for other materials-handling jobs, too. Write for complete information on the 30-horsepower Model RTI and the 57-horsepower Model UTIL with shuttle gears for 6 forward and 6 reverse speeds. UTIL features now available include the new turbo-cell diesel engine and hydraulic power-flow steering.



MINNEAPOLIS-MOLINE
MINNEAPOLIS 1, MINNESOTA

Circle No. 101 on Reader Service Card for more information



Equipped with a V-type snow plow, this MM Model RTI Wheeler gets easily into cramped quarters . . . does a fast job of clearing narrow driveways or traffic lanes.



With this fluid-driven sweeper mounted on the RTI, you sweep traffic lanes, parking lots, and storage yards fast and clean. You get rid of the snow before it has a chance to melt and form troublesome ice.



Deep, hard-packed snow drifts are no problem for this rotary plow and blower, mounted on the RTI. Powerful blower distributes snow well away from plowed area . . . eliminates banking.

labor-saver

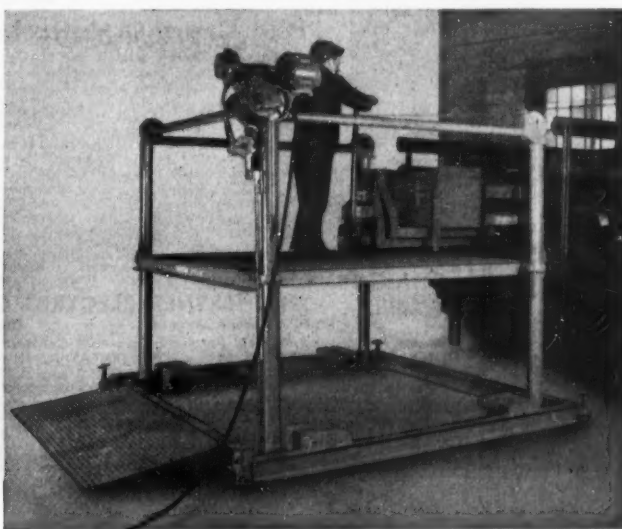
Handles your heavy loads from
level to level

Safely Easily

NEW SERVICE LEVELER



*Simplifies movement of factory trucks
between two floor levels.*



*Portable model at additional cost—Can be moved to facilitate
loading and unloading of trucks in factory yard, etc.*

Save your workers a lot of backaches—save time, trouble and money, by handling heavy loads from level to level with the new Service LEVELER. Dependably powered by a rugged, fully-enclosed, 1 H.P. motor, it lifts as much as 6,000 pounds as high as 5 feet . . . in less than a minute. Loads, machine and operator are fully protected under all operating conditions. Outstanding safety features include: easy manual control of starting and

stopping at any height; automatic top and bottom limit stops; positive motor cut-off stops; centrifugal safety governor; slack cable shut-off; post guard rings. Here's a unit that can be installed anywhere in just a few hours at amazing low cost . . . requires no sub-surface installation . . . obsoletes slow, dangerous manual handling . . . pays for itself in a very short time. Write for detailed specifications today.

COST-SAVING SERVICE MATERIALS HANDLING PRODUCTS



Motowlift Gas-Powered
Hydraulic Lift Truck



Service Hand Lifter



Service Liftable



Service Electric
Hydraulic Lifter



Service Hydraulic
Leverlift



Service Leveler

SERVICE CASTER & TRUCK CORP.

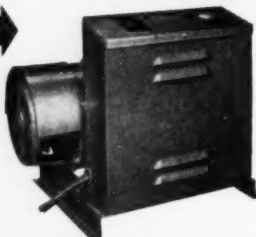
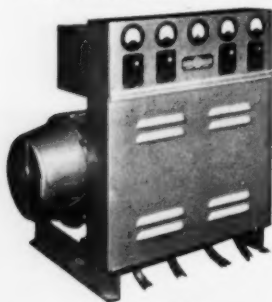
Executive Offices: Albion, Michigan
Plants at Albion, Michigan and Somerville 43, Mass.

Circle No. 133 on Reader Service Card for more information

Consult Hertner for single circuit, multiple circuit, or custom-built motor- generator battery charging equipment for driver ride trucks or motorized hand trucks

"KX" Charg-O-Matic Line

Single or multiple circuit models are available for charging driver-ride electric trucks. The single standardized circuit line is available in 13 models for charging lead acid batteries and 7 models for charging Edison batteries. For central station charging the unitized switchboard is provided in sections with a motor generator set for charging two or more batteries simultaneously.



"HX" Charg-O-Matic Line

Single or four circuit models are available for charging motorized hand truck batteries—a series for lead-acid batteries and a series for Edison batteries.

Double Duty Charge Control

An accessory for automatically charging two batteries from either an "HX" or "KX" single circuit battery charger.

Special-built Battery Chargers

Where battery charging equipment is needed to do a special job, Hertner engineers and modern plant facilities are available to produce a charger to fit any requirement.

Standard Models for immediate shipment. For complete information consult your electric truck or Hertner representative, or write direct.



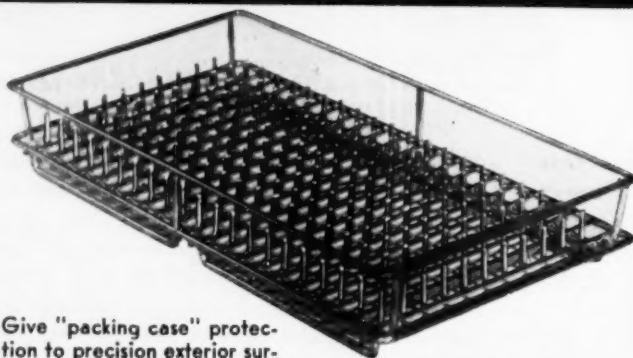
THE HERTNER ELECTRIC COMPANY

12690 Elmwood Avenue • Cleveland 11, Ohio

A General Precision Equipment Corporation Subsidiary

MOTORS • MOTOR-GENERATORS • GENERATOR SETS • REPRESENTATIVES IN PRINCIPAL CITIES

SEGREGATE VITAL SURFACES



Give "packing case" protection to precision exterior surfaces by handling your delicate parts in a Jaxon pin rack.

Light, sturdy, welded wire Jaxon pin racks provide convenient and effective protection during processing and handling of parts in your plant.

The rack stacks for storage and transportation yet gives individual support and separation to each part.

Ideal for degreasing, inspection and handling between operations.

Spacing and number of support pins, per rack, may be varied to meet your particular requirements.

Write for complete information.

JAXON WIRE PRODUCTS

PHONE 3-4373 1705 PROBERT ROAD JACKSON, MICH.

Circle No. 84 on Reader Service Card for more information

AD LITERATURE

Continued

A complete catalog and list of available discounts may be obtained from Bay Products Inc. It includes the full line of welded steel shop boxes. Skid base form lock for safe stacking.

Circle 17 on Reader Service Card

Walkies engineered to fit your job, at no extra cost, are described in a bulletin you can get from the Moto-Truc Co.

Circle 106 on Reader Service Card

A copy of the new Hamilton Caster Co. catalog will familiarize you with common caster terms, types and uses. It may be obtained without charge by circling the Reader Service number.

Circle 77 on Reader Service Card

Free Technical Engineering advice and service are available from Goodyear, Industrial Tire Division. The company claims a complete choice of tread designs, complete choice of types, and complete choice of sizes.

Circle 63 on Reader Service Card

"Gas vs. Electric" is the title of a folder which you can get from Lewis-Shepard Co. It steps boldly into the age-old argument as to which type of industrial truck is best for various conditions.

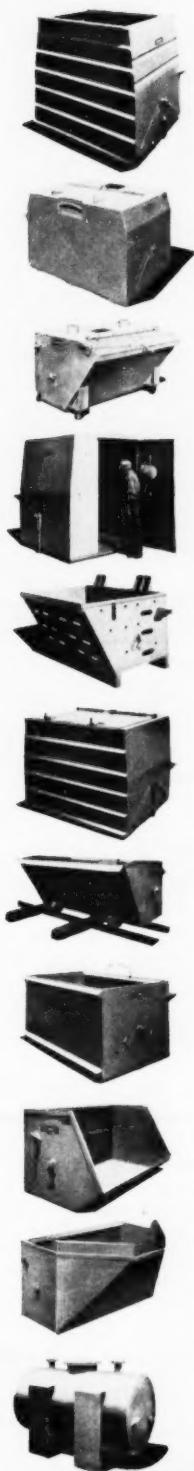
Circle 86 on Reader Service Card

Case histories of money-saving conveyor installations are included in "Owners Report" available from The Oliver Corp., A. B. Farquhar Div. It is full of facts and figures which will be of great interest to you.

Circle 57 on Reader Service Card

A three-way braking system available in Clark Electric Trucks, is described in literature which will be sent to you on request. The system provides safety, positive action and smooth deceleration with no grabbing.

Circle 34 on Reader Service Card



You will Dump High Costs, too..

... when you install the Dempster-Dumpster
System of Bulk Materials Handling

Manufacturers over the nation have learned to eliminate the costly and inefficient method of handling bulk materials with conventional dump trucks, drivers and loading crews. You can equip one truck with a hydraulically operated Dempster-Dumpster. Then, inside or outside buildings at convenient accumulation points, you simply place detachable Dempster-Dumpster Containers, in capacities up to 4 times that of conventional dump truck bodies, with each designed to suit the materials to be handled—be they solids, liquids or dust . . . hot or cold . . . bulky, light or heavy. Containers shown at left, all handled

by one Dempster-Dumpster, are only a few of the many available or that can be built to meet your needs. The Dempster-Dumpster, operated by only one man, the driver, serves scores of containers . . . one after another, as shown below.

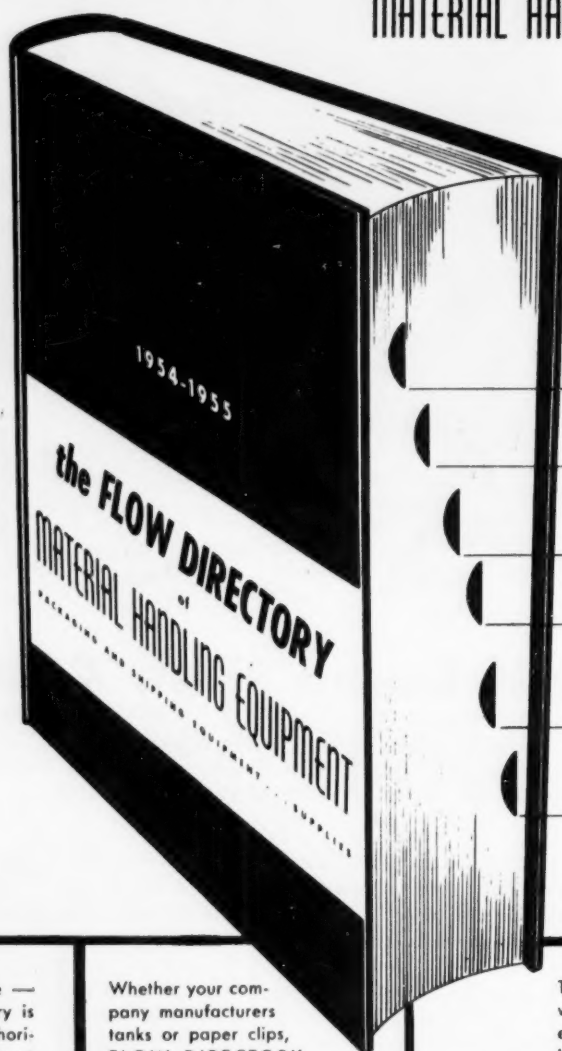
You eliminate trucks standing idle. You eliminate re-handling of materials. You eliminate loading crews. You increase efficiency, sanitation and good plantkeeping with this Dempster-Dumpster System—the lowest cost method of bulk materials handling ever devised. Write to us for complete information. Manufactured exclusively by Dempster Brothers, Inc.



DEMPSTER BROTHERS, 614 Shea Bldg., Knoxville 17, Tenn.

READY SOON!

THE ALL NEW 1954-1955 **FLOW DIRECTORY** of MATERIAL HANDLING EQUIPMENT



NEW TAB INDEX

ENGINEERING AND TECHNICAL
DATA

WHO SELLS OR RENTS
EQUIPMENT

MANUFACTURERS' CATALOGS

TRADE MARK INDEX

PRODUCT CLASSIFICATION

Right Up To The Minute —
The new FLOW Directory is
your own library of authori-
tative information about
material handling equipment
and accessories.

Whether your com-
pany manufacturers
tanks or paper clips,
FLOW DIRECTORY
listings will lead you to
purchase the "right"
equipment to do your job.

Thorough Product Classification tells you
who makes every known piece of M. H.
equipment as well as who sells it . . .
Identifies it by Trade Mark . . . Provides
complete engineering and technical data with hun-
dreds of charts and graphs . . . Includes manufac-
turers' catalogs showing all types of equipment for
every handling task.

ORDER YOUR COPY OF FLOW DIRECTORY NOW!

The new, up-to-date edition will be mailed to sub-
scribers as soon as it comes off the press. So, make
your copy reservation now . . . all orders received
up to press time will earn the special pre-publication price of only
\$5.00. After publication, the price will be \$6.50. Sales in Ohio
require additional 3% sales tax.

Please rush me () copy-ies of the **FLOW
DIRECTORY** as soon as they're off the press.

Name Title

Company

Address

FLOW DIRECTORY

1240 Ontario St. • Cleveland 13, Ohio



Model "S-Hundred"
Cap. 500 lb. to 2000 lb.

STACK 'EM CEILING HIGH

BARRETT PORTABLE AND STATIONARY ELEVATORS SAVE NEEDED FLOOR SPACE

Use that vacant air space between floor and ceiling . . . it means less required warehouse space . . . less fuel . . . less lighting . . . less labor . . . less maintenance. Let a Barrett Elevator pay you dividends in keeping overhead down.

To meet varied storage requirements, Barrett designed a wide range of elevators from a small hand operated gearless elevator—through junior and senior hand operated types of 500 to 5,000 lb., into electrically operated lifts of ½ to 15 h.p.

The ideal, money-saving combination is a Barrett Elevator (to suit your needs) plus a Barrett Storage Rack System. Illustrated above is a Barrett sectional steel rack for efficient storage of drums or barrels. Other models for open stock, boxes, skids.

An experienced Barrett Engineer will gladly recommend the Barrett combination best suited to your requirements. Call on him for consultation.

BARRETT-CRAVENS COMPANY

4619 S. Western Blvd., Chicago 9, Illinois

Representatives in All Principal Cities

Canadian Licensee: S. A. Armstrong, Ltd., Toronto, Canada



BARRETT

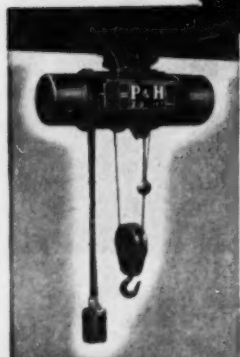
GET THIS NEW CATALOG 535 on the complete line of Barrett material-handling equipment. Your request will bring a copy to your desk promptly.



ONE MAN DOES MORE THAN 3 OR 4...WITH A BARRETT

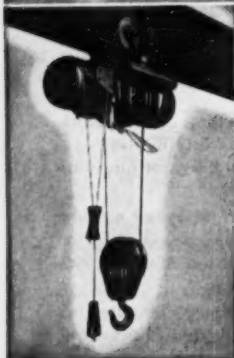
Circle No. 20 on Reader Service Card for more information

FLOW • JANUARY, 1954



P&H Zip-Lift Electric Hoist (Pushbutton control)

Handy little power-house for loads from 250 pounds up to one ton. Versatile — in use in metal shops, dairies, hospitals, bakeries. Solves your load-handling problem within the weight limits specified. Literature is available for more detailed information. Ask for it.

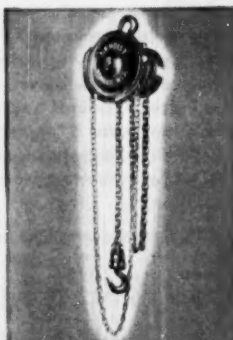


P&H Zip-Lift Electric Hoist (Rope-control model)

You can do anything with this model that you can with the Pushbutton Control Zip-Lift. The less expensive rope-control gives you a break on price — doesn't cut down the number of jobs you can perform. You get years of trouble-free service at an extremely reasonable initial cash outlay.

P&H Chain Hoists

Perhaps you're in the market for a chain hoist; rather than wire-rope. If you are, you'll have to look far to find a better value than these P&H work-horses. Handle up to 25 tons easy as pie. Spur-gear; Timken or roller bearing trolleys; Army-type trolleys — whatever you need. Ask for literature on the complete line.



P&H Jib Cranes

Hang your hoist on a P&H Jib Crane — then you've got a dependable one-two combination working for you. Eight different models — bracket-type, mast-type and pillar-type. Capacities up to 12,000 pounds. Use the coupon for fast return of literature on the complete P&H Line.



P&H Hevi-Lift

For heavy loads — and your own particular problem. The Hevi-Lift is a custom-built hoist — manufactured to your specifications. Over 3,000,000 variations possible on this husky load-handler. You're sure to find the right combination for you. Take a look at the literature available — then see your P&H distributor for a concrete solution.

Here's the big news in hoists for 1954

Now — Look what you get from **P&H**

1. *A greatly augmented product line — complete selection for your needs*
2. *Mechanical superiority that lets you work with confidence and profit*
3. *25% overload safety factor on every P&H Hoist you use*

REMEMBER the dependable service you've been getting from the P&H standbys? The quick, push-'em-around action from the P&H Pushbutton Zip-Lift; and the husky-muscle load-handling from the P&H Hevi-Lift?

Now you can get that same dependable service from a greatly augmented P&H Hoist Line — a line that gives you a selection of practically every kind of hoist service you need.

What's been added? Well, there's the Rope Control Zip-Lift, for instance. Same maneuverability; same light, quick touch that solves your load-handling problems. And, best of all — the Rope Control lifts dollars off the price of this model. You save on the initial purchase price — and you save for years afterward — in increased speed and flexibility on your production line.

But that's not all . . .

Next there's the new P&H Line of Chain Hoists. For spots where the work problem demands a chain hoist — you get a complete selection from P&H. All kinds available — spur-gear; army-type trolley; low-headroom trolley — and in capacities up to 25 tons.

Need a jib crane? P&H supplies them too. Eight different models — bracket-type, mast-type and pillar-type. Reaches from 8 to 20 feet — capacities up to 12,000 pounds.

Yes, P&H gives you *complete* coverage in your hoist service. Every new model built with the painstaking care and meticulous attention to detail you've come to expect from P&H.

Each hoist is guaranteed to withstand an occasional overload of 25% more than its rated capacity. Take a look at the illustrated line and use the coupon below — today.

This coupon and a 3¢ stamp gets you complete information on the P&H Hoist Line.

P&H HOISTS

HARNISCHFEGER
CORPORATION

4643 W. National Ave. • Milwaukee 46, Wis.

Circle No. 155 on Reader Service Card

TEAR OUT COUPON AND MAIL TODAY!

P&H Hoists

HARNISCHFEGER CORPORATION

4643 West National Avenue, Milwaukee 46, Wisconsin

I'd like to know more about the P&H complete line. I'm particularly interested in — Pushbutton Zip-Lift ☐; Rope-Control Zip-Lift ☐; Hevi-Lift ☐; Chain Hoists ☐; Jib Cranes ☐. Send the dope to:

Name.....Title.....

Company.....

Address.....

City.....Zone.....State.....



**"... As I see it, the new
Mathews Loadstar Trolley
is just the thing for this job."**

● There is a lot of that kind of talk these days about this rugged newcomer to the 4" trolley conveyer field. Over a period of five years Mathews engineers have developed this new top-quality precision wheel, the No. 4207 Loadstar, for those conveying jobs which demand unusual stamina. Your nearby Mathews representative has full information on this high-quality trolley. Have him tell you about it and write today for Bulletin LS-1 announcing and describing it in detail.



MATHEWS CONVEYERS

GENERAL OFFICES Mathews Conveyer Company
ELLWOOD CITY, PENNSYLVANIA

PACIFIC COAST DIVISION . . Mathews Conveyer Company West Coast
SAN CARLOS, CALIFORNIA

CANADIAN DIVISION Mathews Conveyer Company, Ltd.
PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities

Circle No. 95 on Reader Service Card for more information

AD LITERATURE

Continued

Want to conserve floor space? Barrett Cravens Co. will show you how its portable and stationary elevators will help you do just that, in a bulletin offered in this issue of FLOW.

Circle 20 on Reader Service Card

What have other firms in your field done to solve handling problems and increase profits? Rapids-Standard Co. will send you complete field reports to help you design cost-saving systems of your own.

Circle 114 on Reader Service Card

Eight ways that Wright-Hibbard fork lift trucks can save you money are discussed in this month's ad by Wright-Hibbard Industrial Truck Co. For complete details, circle the number below.

Circle 147 on Reader Service Card

A gas truck with electric transmission is described in new literature available from Automatic Transportation Co. The Automatic Dynamotive is the name of the truck which is said to do for material handling what diesel-electric power has done for rail-roading.

Circle 9 on Reader Service Card

Mass positioning of material at work level is made possible by the Work-O-Matic Gravity-Fed Hoppers of Union Metal Mfg. Co. Data is available to tell you how these hoppers can save time and speed production.

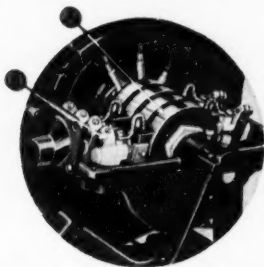
Circle 141 on Reader Service Card

You can roll a new floor right over the old, and start using it immediately afterward, according to Rock-Tred Corp. You can get details on how Redi-Roll can abolish downtime due to floor failures in your plant.

Circle 121 on Reader Service Card



**BUILT FOR CONSTANT DUTY
TROUBLE-FREE SERVICE**



APPLETON engineering and craftsmanship is notable in every REELITE. Copper collector rings "A" are accurately machined and have ample capacity to carry rated current. Brushes "B" set in a floating tension assembly maintain alignment and pressure. Grease packed ball bearings and spring housing require no maintenance.

APPLETON ELECTRIC COMPANY
1729 Wellington Avenue, Chicago 13, Illinois



Also Manufacturers of:



Explosion-Proof
Fixtures



Malleable Iron
Union Fittings



Industrial Lights



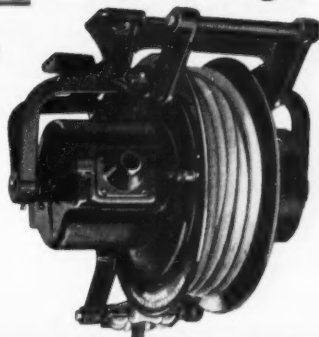
"ST" Series Connectors



Outlet
Boxes

Lower Handling Costs

with



APPLETON REELITE

TRADE MARK

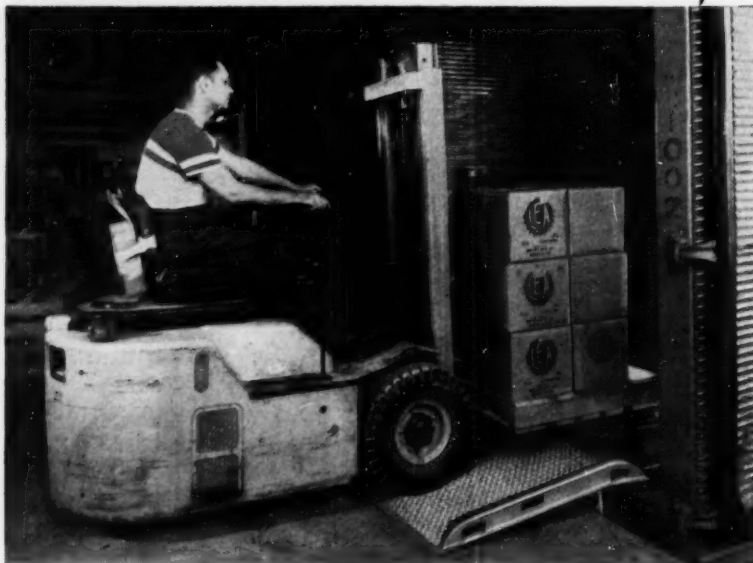
***Speeds Up Production with Safety—Pays Out and
Retrieves Power Supply for Moving Machinery!***
Wherever there is a need for feeding power to moving electric machinery, you can be sure there is an APPLETON REELITE of ample power and capacity to do the job!

Constant Duty REELITES perform a dual service first they pay out cable to supply current to machines that move to and from a fixed current source second, they retrieve slack cable, thus preventing hazardous conditions to men and machines.

One or more of the innumerable applications of APPLETON Constant Duty REELITES is sure to serve you profitably.

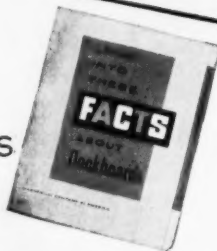
Why not write for complete details today?

Circle No. 12 on Reader Service Card for more information



DO YOU WANT THE FULL, MONEY-**SAVING** *Facts* ABOUT DOCKBOARDS?

THIS NEW
FACTS FILE GIVES
THEM TO YOU...



The new Magcoa *Facts File* is full of facts you ought to have before you invest in a bridgeplate for your loading dock. Here are some of the facts you'll find in your copy—

- The actual costs of dangerous makeshift plates
- What other companies learned... the hard way
- Why sixty multi-plant national companies standardized on Magcoa Dockboards
- What your local Magcoa Representative knows about your dock

You'll find these facts and more in the new Magcoa *Facts File*. It's based on a study of what smart buyers demand (and get); gives you tips on net costs; talks in dollars and cents, specific facts... from your viewpoint.

Use the handy coupon to get your free copy.

MAGNESIUM COMPANY OF AMERICA

MATERIALS HANDLING DIV., EAST CHICAGO 1, IND. — Representatives in Principal Cities

DIVISION OFFICES:

NEW YORK 20,
30 Rockefeller Plaza
PHILADELPHIA 18,
8001 Southampton Ave.
WASHINGTON 5, D. C.,
Walker Bldg.
HOUSTON 17,
7657 Moline St.
LOS ANGELES 34,
8922 W. 25th St.
SAN FRANCISCO 4,
Reed Bldg.

☐ Please send me the free new Dockboard *Facts File*

Name & Title _____

Company _____

Address _____

City-Zone-State _____

Circle No. 91 on Reader Service Card for more information

AD LITERATURE

Continued

Magnetool Div. of Multifinish Co. has developed a hand pick-up device for rapid and convenient pick-up of small parts, nails, etc. It is said to be permanent, non-electric, and requires no batteries.
Circle 103 on Reader Service Card

The amazing versatility of conveyor systems manufactured by Mechanical Handling Systems is revealed in a bulletin you can get. Use the number below.

Circle 96 on Reader Service Card

Want to eliminate shipping labels? Multistamp Co. will send you a free sample of its "form-cut" stencil and print along with literature telling about its method for printing direct on packages.

Circle 108 on Reader Service Card

An eye opener in major industries from coast to coast is the skid box made by G. B. Lewis Co. They save space, handle even the heaviest loads and help you to achieve additional profits.

Circle 87 on Reader Service Card

The Metzgar Live-Roller conveyor is specifically recommended for moving sharp-cornered and rough-edged items... conveying various sizes and shapes... and as a power unit in a gravity line. Metzgar Conveyor Co. will send you complete information.

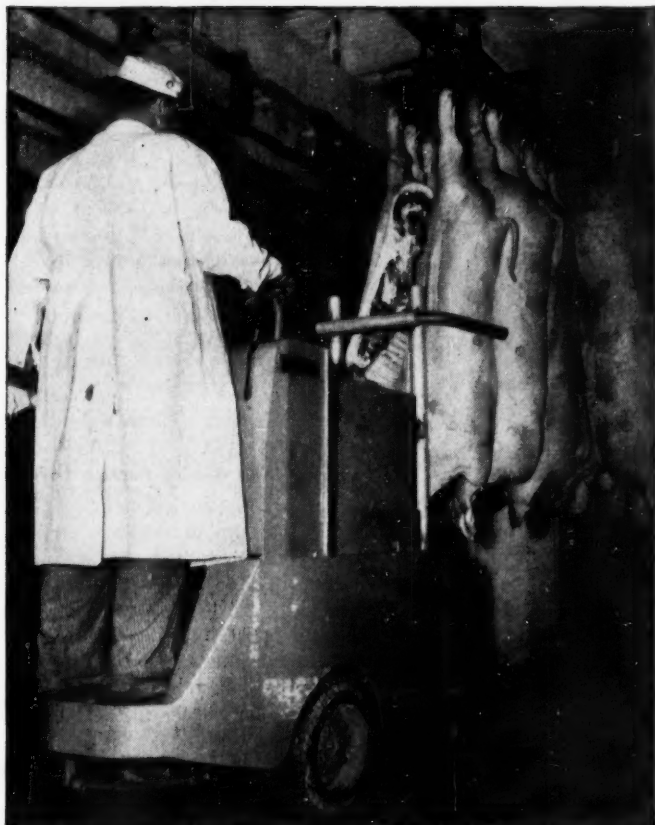
Circle 97 on Reader Service Card

"Economical Material Handling" is the title of a book available from The Loudon Machinery Co. It is full of time-saving, cost-cutting ideas and case histories. Free at no obligation.

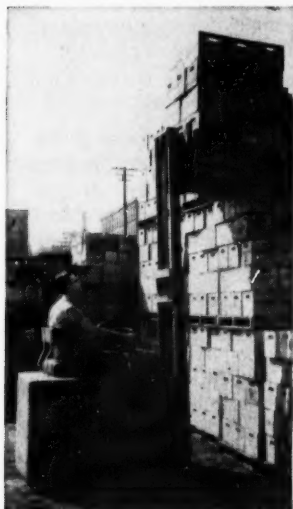
Circle 88 on Reader Service Card

B.F. Goodrich

FREE TIRE AND WHEEL ANALYSIS can save you as much as 50% on industrial tires



OILY FLOORS IN YOUR PLANT? Industrial tires go to pieces in a hurry unless you use an oil-proof compound in your tires. Ask the BFG man for recommendations.



ROUGH HAULING SURFACES? They can slash tire life, increase maintenance costs and foul up work schedules. The BFG man can show you how to get maximum tire life.

FRAGILE LOADS? Materials handling costs skyrocket when fragile materials break. Maybe your handling methods, equipment or tires are to blame. A Tire & Wheel Analysis can help you.

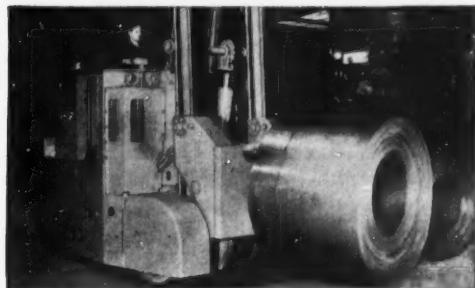
Circle No. 68 on Reader Service Card for more information

Here's how to start cost cutting

Mail the coupon below for free information on the B. F. Goodrich Tire and Wheel Analysis Plan. Without obligation you can have a trained BFG man study your operations, analyze equipment, loads, hauling surfaces and handling methods. He will tell you what type and size tires, what tread design and compound will serve you best. Because BFG makes a *complete* line of industrial tires, you get impartial recommendations, plus maintenance suggestions that alone may save you hundreds of dollars. Mail the coupon today! A special TW Analysis Plan is available for manufacturers of materials handling equipment.



OUTDOOR OPERATIONS? Tire problems are different from those of inside hauling. The BFG man will show you how to pick the right type tire.



HEAVY LOADS AND EQUIPMENT? Overloads can cause industrial tires to fail prematurely. Your B. F. Goodrich man knows how to match the tire and the load.

Specify B. F. Goodrich tires when ordering new equipment



The B. F. Goodrich Company
Tire & Equipment Division
Department TW-345
Akron 18, Ohio



WRITE FOR THIS BOOK

Please send me:
☐ Additional information on your new Tire and Wheel Analysis Plan
☐ A free copy of your "Industrial Tire Guidebook"
 Name _____
 Company _____
 Street _____
 City _____ Zone _____ State _____

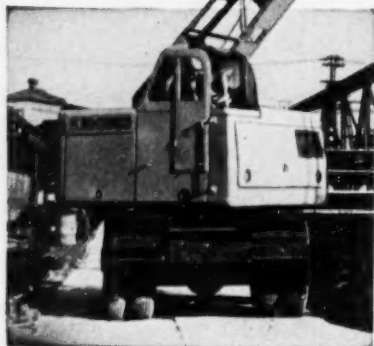
GAS ECONOMY ?

**1 gallon
per hour!**

**first of
COLES
CRANES**

Bonus FEATURES

COLES advanced engineering with Gas-Electric design reflects the continuous study made of Industrial requirements. No other crane of similar capacity can show such terrific economy in **BOTH OPERATING AND MAINTENANCE COSTS**. A few users report maintenance cost **LESS** than on average fork lift truck. **ECONOMY** of gas is only one of the many COLES BONUS features.



A Mobile Crane is the Most Flexible Lifting Tool Yet Designed!

● The Coles Crane is the most flexible of mobile cranes, having 360° full circle swing, cantilever type boom, and reversible steering. Every conceivable **SAFETY DEVICE** is fitted as standard on every COLES CRANE. These devices are designed to protect the Operator, the equipment and your investment. In Fact, COLES is the outstanding crane—that gives the Material Handling Engineer—remote control over his operator. When considering the purchase of a mobile crane—it will pay you to investigate COLES.

WRITE FOR CATALOG

Information pertaining to several models with complete specifications and illustrations of the various lifting operations yours for the asking.



The name that carries weight
in material handling

**COLES
CRANES**

COLES CRANES, INC., 942-F JOILET, ILL.

Circle No. 35 on Reader Service Card for more information

AD LITERATURE

Continued

A practical answer to the increasing importance of production line marking is provided by Industrial Marking Equipment Co., Inc. Write for a catalog on the Industrial Auto-Printer.

Circle 79 on Reader Service Card

A narrow belt unitized conveyor for handling small dimension light weight containers has been announced by Island Equipment Corp. A free booklet is available on request. Use the number below.

Circle 80 on Reader Service Card

There is no limit to the range of jobs that Heppenstall Safe-T-Tongs handle quickly, safely and economically. You obtain complete information and technical assistance.

Circle 71 on Reader Service Card

Do you know the five commonly used methods of sealing boxes? Hinde & Dauch Paper Co. has published an information packed booklet entitled "How to Seal Corrugated Shipping Boxes". You can get a copy free.

Circle 75 on Reader Service Card

A low-cost conveyor attachment which marks cartons and cases automatically is described in a brochure offered by Adolph Gottscho, Inc. The literature shows models for imprinting top, sides of every kind of package.

Circle 65 on Reader Service Card

A free catalog containing caster specifications is available from Faultless Caster Corp. If you have a tough caster problem, Faultless probably has the solution for you.

Circle 58 on Reader Service Card

A new booklet published by Elwell-Parker Co. illustrates how E-P special engineering can be adapted to your needs. It is a booklet which might save you considerable money.

Circle 56 on Reader Service Card

ONLY CLARK ELECTRICS

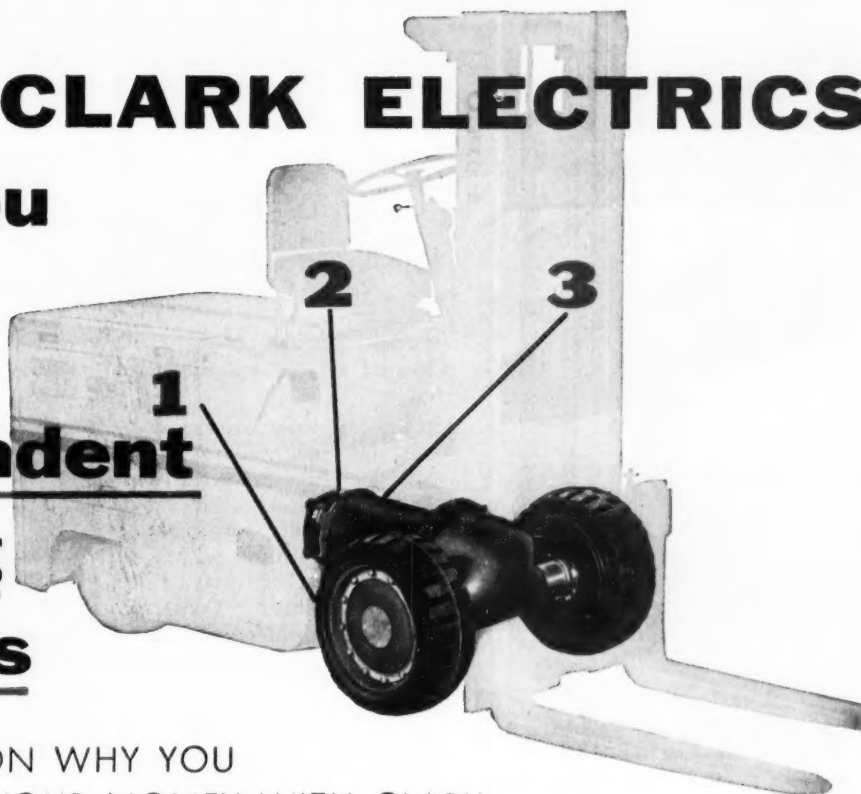
give you

3

independent

braking

systems



ANOTHER REASON WHY YOU
GET MORE FOR YOUR MONEY WITH CLARK...

1 Hydraulic service brakes on the drive

wheels: by incorporating the internal expanding double-shoe design with large braking surface, positive control of the truck at all times is assured for even the severest service requirement.

2 "Dead-man" brake on the armature

shaft: this positive acting brake takes hold automatically the instant that the driver leaves the truck—disconnects the power, returns all controls to neutral, assures that the truck will remain stationary.

3 Dynamic braking by reversing current

through the drive motor: this braking method permits smooth deceleration, with no grabbing; but positive automatic control eliminates all danger of damage to electrical motors and controls.

This three-way braking system is another exclusive feature of Clark electric fork trucks—the safest electric trucks on the market. It's another good reason for talking to your local CLARK dealer (see the Yellow Pages of your phone book) when you're in the market for electric-battery power fork trucks.

And remember: Only Clark has no axe to grind for any particular type of truck. We produce them all: gas, electric, diesel and L.P.G. fork trucks; POWERWORKER hand trucks; ROSS Carriers. For unbiased experienced counsel, see your Clark dealer today.

WRITE FOR FREE BOOKLET DESCRIBING THE FEATURES AND

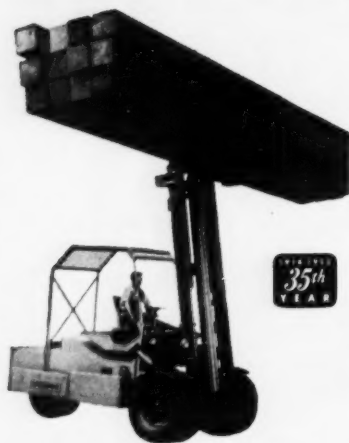
ADVANTAGES OF CLARK ELECTRIC FORK TRUCKS

**CLARK
EQUIPMENT**

Industrial Truck Division
CLARK EQUIPMENT COMPANY
BATTLE CREEK 13, MICHIGAN

Circle No. 34 on Reader Service Card for more information

**THESE SILENT HOIST
WORK HORSES WILL
SAVE UP TO 75%
IN TIME AND LABOR COSTS**



**HEAVY-DUTY FORK
LIFTRUK**
5-7½-10-15 TON CAPACITIES

The heavy-duty "Silent Hoist" LIFTRUK and LIFT-O-KRANE feature fast handling of unbalanced and capacity loads, with maximum stability . . . high lifting range . . . short turns in narrow aisles create added acres to your storage space.

These SILENT HOIST features add up to faster inloading, most efficient inter-plant handling and scientific stacking, quicker out-loading to truck, trailer or car, with time and cost savings, very often up to 75%.

LIFT-O-KRANE

Combination Boom Crane and Fork Lift, with separate power winch for Load Line.

SEND FOR BULLETIN 75 on LIFT-O-KRANE and BULLETIN 77 on LIFTRUK.

**35th
YEAR**



Either machine can be supplied with RAM attachment.

SILENT HOIST & CRANE CO.
Pioneers of Heavy Duty
Materials Handling Equipment

888 63rd STREET, BROOKLYN 20, N. Y.
Circle No. 153 on Reader Service Card

AD LITERATURE

Continued

Ever have a battery fall off a shipping dock? The Edison Storage Battery Division of Thomas A. Edison Inc. tells about one which fell 4½ ft. off a dock and was undamaged. You will want to learn more about this rugged product.

Circle 53 on Reader Service Card

Chrysler power, equipped to meet your specifications can be surprisingly inexpensive. There are 10 Chrysler industrial engines and power units, all operating with gasoline, natural gas or L-P gas fuels. The Industrial Engine Division of Chrysler Corp. will tell you all about them.

Circle 43 on Reader Service Card

Any one can make professional charts with the graph-making method recently perfected by Chart-pak, Inc. You can get complete details.

Circle 45 on Reader Service Card

Lift-Jack Systems, wood or steel semi-live skids, drum trucks, hand trucks, platform trucks, box trucks and casters are all described in a free catalog you can get from Colson Corp.

Circle 36 on Reader Service Card

A facts book which will permit you to see for yourself why Budy trucks are safe, maneuverable, economical, and easy to maintain is offered by The Buda Co. Get your copy by using the number below.

Circle 27 on Reader Service Card

The latest bulletin on American Hand Trucks is offered by American Pulley Co. It describes fully, American's five year guarantee.

Circle 5 on Reader Service Card

Full details on the new Aro Air Hoist are available at no obligation. The unit is said to feature unusual safety, is small, compact, and weighs only 28½ lb.

Circle 11 on Reader Service Card

PLUG IT IN --- AND GO ---



In operations where noxious engine fumes are a health hazard, this agile electric motor operated BUTLER CARSCOOP is a practical answer. Operates on 220 or 440 volt current. (Specification bulletin 250E)



MODEL GA9E



The BUTLER (electric powered) CARSCOOP is quiet, quick, agile. Short turning radius makes it ideal for work in box cars or close quarters . . . 10 or 12 cu. ft. bucket. Exclusive Hydro-Reel automatically takes up and pays out, keeping cable in tension. Cable allows operations up to approximately 85 ft. from source of power. Gasoline models also available. Write today for complete specifications.

**BUTLER BIN CO. CARSCOOP
DIVISION**

941 BLACKSTONE, WAUKESHA, WIS.

Also manufacturers of material bins, weighing batchers, bin gates, elevators and screw conveyors.
Circle No. 159 on Reader Service Card for more information

FLOW • JANUARY, 1954

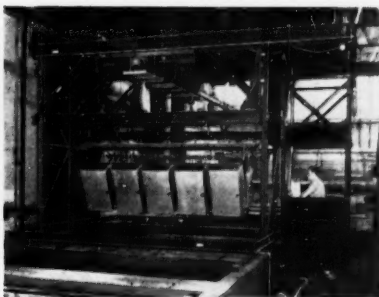
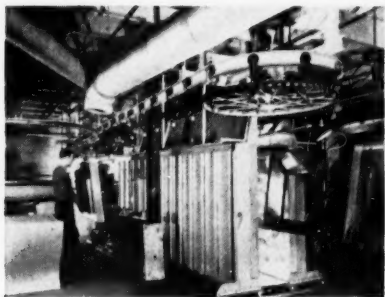
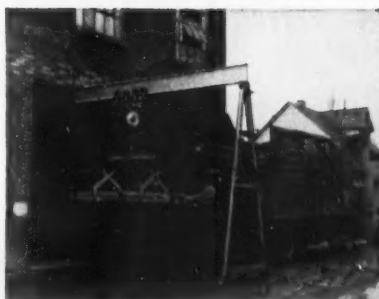
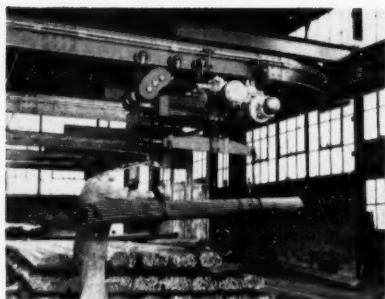
MONORAIL *Pays!*

INCREASES TONNAGE

From 26 to 48 tons of steel rod per day was the increased movement produced by a properly engineered monorail system.

LOWERS COST

This simple system actually saved \$150 in handling costs within four months of operation. No more sheet-by-sheet movement.



SAVES TIME

Passage, on monorail, of metal parts through infra-red dryer, cuts 70% from former drying time. All other handling in plant on monorail.

MORE CAPACITY

30% more capacity was added to metal cleaning process by handling a third more units on carrier with one man operation from cab control.

LESS LABOR

Operators claim to save 26 man hours per truck over former unloading time. Interlocking monorail cranes in the plant also reduce handling costs.



Write for Bulletin C-1
showing many more cases
where MONORAIL PAYS!

THE AMERICAN MONORAIL COMPANY

13129 ATHENS AVENUE

CLEVELAND 7, OHIO

Circle No. 4 on Reader Service Card for more information

FLOW • JANUARY, 1954

61

AD LITERATURE

Continued

Details of the 4-speed Varilift Grand Shop Caddy may be obtained from the manufacturer, Allied Mfg. & Sales Co. The hydraulic lift hand truck enables one man to lift as much as 500 pounds to a height of 54 inches.

Circle 2 on Reader Service Card

Descriptions of numerous applications in which the Appleton Reelite was employed to lower

handling costs may be obtained from Appleton Electric Co. The equipment can be centrally located in the plant to pay out and retrieve electric power lines for moving machinery.

Circle 12 on Reader Service Card

Pallets, pallet boxes, shipping containers and crates are all described in literature available from the Bigelow-Garvey Lumber Co. Numerous special container types are shown, and the company maintains facilities for

designing other special types to fit specific needs.

Circle 19 on Reader Service Card

Complete specifications on the electric powered Carscoop may be obtained from the Butler Bin Co. It features a split-second shift from forward to reverse and has a very short turning radius. An automatic reel keeps approximately 85 feet of cable at constant tension.

Circle 159 on Reader Service Card

A well-illustrated catalog containing complete specifications for several models of mobile cranes is available from Coles Cranes, Inc. Pictured in various lifting operations, the catalog shows just how these cranes perform.

Circle 35 on Reader Service Card

Colson Equipment & Supply Co. has its catalog available showing various models of the Cesco skip hoist dumper. Both portable and stationary models are described. Fifteen hundred pound loads can be hoisted from six to 20 feet depending upon the model in use.

Circle 47 on Reader Service Card

Bulletin No. 53 is available from The Moto-Truc Co. presenting all the details about standard and custom-built Walkie lift trucks. The firm maintains engineering facilities to help design trucks to fit specific jobs at no cost for the special design.

Circle 106 on Reader Service Card

One man can open balky box-car doors without danger of strain or injury, according to the Nolan Co., whose literature describes the use of its one-man door opener. Its first day's savings are said to more than pay its total cost.

Circle 109 on Reader Service Card

Literature illustrating applications of Rapistan conveyor systems in specific industries may be requested from the Rapids-Standard Co. The valuable reading material is designed to show you how profit-making principles have been incorporated into conveyor use and design.

Circle 114 on Reader Service Card

Here's HAND TRUCK News!



**ONLY
AMERICAN
GIVES YOU
THIS
GUARANTEE**

Clip and Mail Coupon
For Bulletin



Materials Handling by



Complete line of Pressed-Steel Hand Trucks,
Barrel Cradles, and Steelite Industrial Wheels

THE AMERICAN PULLEY COMPANY
4290 Wissahickon Ave.
Philadelphia 29, Pa.

Gentlemen:

Please send me your latest bulletin on American Hand Trucks.

Name _____

Firm Name _____

Address _____

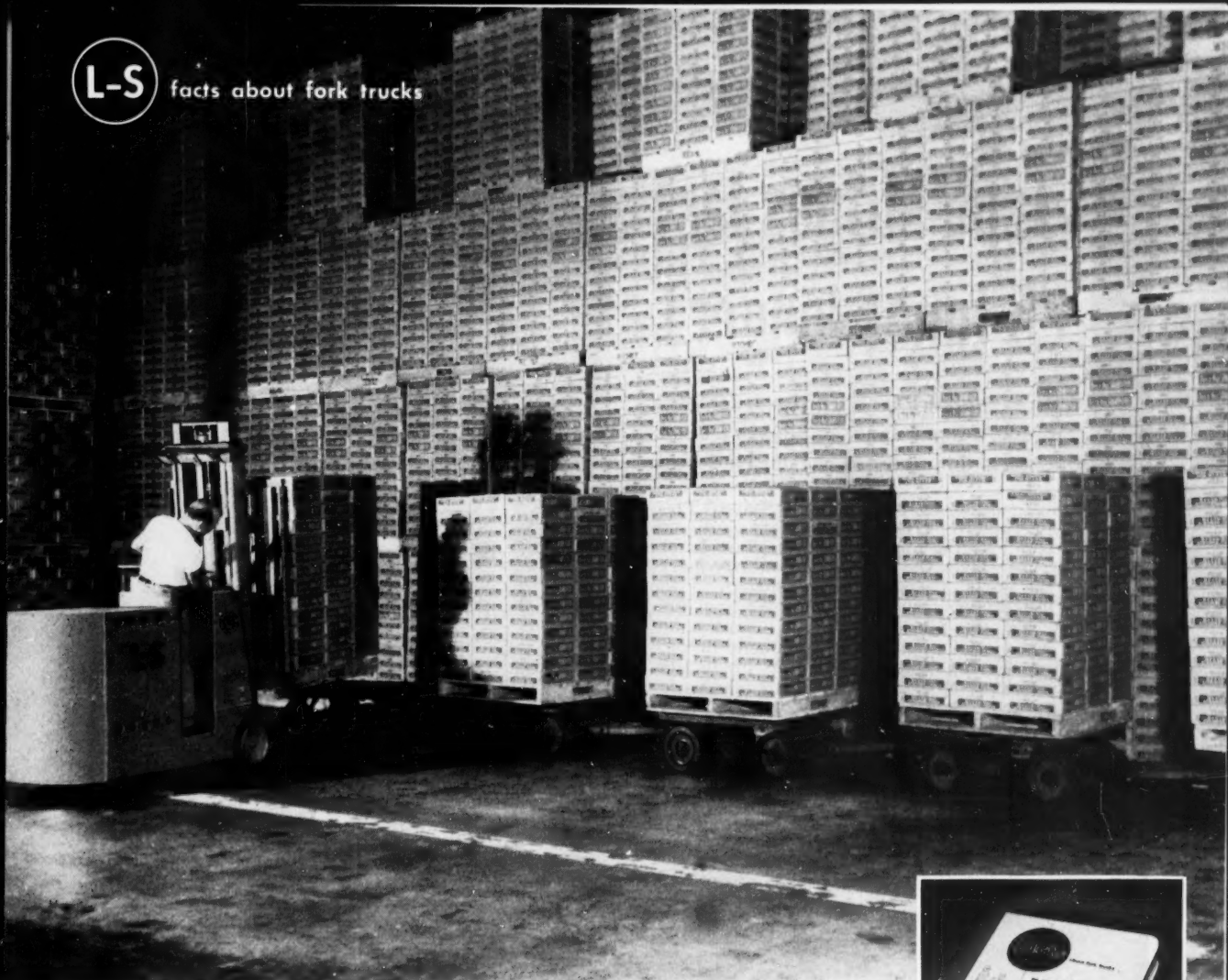
City _____

Zone _____

State _____

Circle No. 5 on Reader Service Card for more information

L-S facts about fork trucks



Lewis-Shepard SpaceMaster Electric Fork Truck, 4000 lbs. cap., unloads L-S Trailers at Beech-Nut Packing Company. All SpaceMasters are lubricated for life — absolutely no periodic greasing.

Report shows average annual saving of \$973.48 with electric fork truck



Get the facts about fork truck operating costs! Lewis-Shepard's new "Gas vs. Electric" folder shows you in dollars and cents how Electric Trucks give average annual savings of \$973.48 a year over gas trucks.

An objective digest of user and manufacturer reports, this valuable L-S brochure gives you factual comparisons of depreciation, maintenance, lubrication, down-time and power costs for both types. Includes operating cost record sheets designed to let you judge for yourself . . . in your

own plant . . . comparative operating costs of gas and electric trucks. Dispels the fog that surrounds this vital question.

WRITE TODAY for these Gas vs. Electric facts; plus exclusive L-S "Lubricated for Life" Story.



LEWIS-SHEPARD

14-1 Walnut St., Watertown 72, Mass.

Here's more evidence of the cost-cutting dependability of L-S Electric Trucks. Listed are a few of the "blue-chip" companies* who have recently reordered L-S Electric Trucks:

Food Processing Co.	50 L-S in use—reordered 12
Rubber Co.	28 L-S in use—reordered 6
Electronics Mfg. Co.	297 L-S in use—reordered 35
Chemical Co.	112 L-S in use—reordered 18
Motor Car Co.	45 L-S in use—reordered 5
Glass Mfg. Co.	22 L-S in use—reordered 9

*Company name on request

The "MASTER" Line

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

Circle No. 86 on Reader Service Card for more information

Tape stripes last 5 times longer!

...as marking for traffic lanes, storage areas, danger zones at Bausch & Lomb Optical Company, Rochester, New York

In use for over 21 months! "Scotch" Plastic Tape No. 471 proved the ideal solution to lane marking problems at Bausch & Lomb. Tape makes the job easy... clearly marks the areas... goes on in a fraction of the usual time—results in over-all saving of 30%.

Try this tough plastic tape in *your* plant. No special applicating equipment needed, no "drying time" to slow up production. Tape *sticks at a touch* to any clean, dry surface.

For more information write us on your letterhead: Minnesota Mining & Mfg. Co., Dept. F-14, St. Paul 6, Minn.



Quick Facts

about "Scotch" Plastic Tape No. 471

- **TOUGH**—lasts up to 5 times longer than conventional materials.
- **EASY-TO-MATCH COLORS**—Yellow, White, Red, Orange, Blue, Green, Brown and Black.
- **VINYL PLASTIC BACKING**—unaffected by acids, oils, greases, alkalis, water, salts and common commercial solvents.
- **SIZES**—popular widths: 2 to 4 inches. Many others available.

SCOTCH
BRAND
PLASTIC TAPE
No. 471

The term "Scotch" and the plaid design are registered trademarks for the more than 300 pressure-sensitive adhesive tapes made in U.S.A. by Minnesota Mining and Mfg. Co., St. Paul 6, Minn.—also makers of "Scotch" Sound Recording Tape, "Undersal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip Surfacing, "3M" Abrasives, "3M" Adhesives. General Export: 122 E. 42nd St., New York 17, N. Y. In Canada: London, Ont., Can.

Circle No. 102 on Reader Service Card for more information

Selection Factors To Consider When Purchasing A Fork Truck

By Alfred S. King*

HOW does the prospective buyer of a fork truck make his final selection from the dozens of different trucks which meet his basic requirements? How does he evaluate the merits of the various makes? Is his final choice made because of prejudice in favor of a certain make or manufacture?

Unfortunately, methods for selecting trucks are not always logical or actual. And, consequently, they often result in purchasing trucks that do not completely meet job requirements.

The proper way to make a choice, then, is to follow a definite fork truck selection procedure, one that can result in lower handling costs, increased production, or faster service. Such a procedure is outlined here.

First, let us assume that the truck to be purchased must have a capacity of 4000 pounds at 24-inch load center, lifting height of 100 inches, 36-inch forks, riding type with solid or cushion tires. These specifications, incidentally, are arbitrary, although they represent a fork truck in common use today.

An overall survey and analysis was made of trucks that meet the above requirements. The 27 trucks that were investigated represented 15 manufacturers and an estimated 90 percent of the market. Lists of specifica-

tions and manufacturers' catalogs describing the trucks were obtained, and each detailed part in the specifications was examined.

It was found that many specifications varied only slightly, and the differences were not enough to affect the operating characteristics of the truck. It was therefore possible to eliminate many of the detailed portions of the specifications.

Five Selection Factors

Five outstanding selection factors became apparent after the specifications were tabulated, and they formed the basis for the selection procedure. In this procedure, the user determines the relative importance of these five overall selection factors and ranks them accordingly.

In ranking the factors, the user takes into consideration the following:

1. The past experience of his company with fork trucks.
2. Influencing factors which determines motive power.
3. The need for outside servicing.
4. The cost that his company is willing to sustain, and the capital available for investment.
5. The need for maneuverability.

Motive Power. The first decision to be made re-

(Continued on next page)



*Mr. King is a production engineer with National Carbon Company, Inc., Cleveland. His article is abstracted from a Master's thesis performed at Purdue University, under the direction of Professor J. A. Ritchey.

WORK SAMPLE TEST OF FORK LIFT TRUCKS

NOTE: the comparative efficiency of two types of fork lift trucks was determined by a six-hour test.

	Truck A	Truck B
Capacity	6,000 lbs.	6,000 lbs.
Weight of truck	10,800 lbs.	10,500 lbs.
Payload	2,470 lbs.	2,000 lbs.
Number of cycles	358.5	250
Number of lifts	717	500
Height of lift	8 ft.	8 ft.
Average time per cycle	60.25 sec.	86.4 sec.
Time to lift load	13.2 sec.	17.6 sec.
Time to lower load	6.0 sec.	9.9 sec.
Total time, lift and lower	19.2 sec.	27.5 sec.
Total feet lifted	5,736	4,000
Foot pounds lifted	14,167,920	8,000,000
Miles traveled	8.29	4.73
Foot pounds	22,384,740	14,800,000

garding motive power in fork trucks is that between electric-powered trucks and those with internal combustion engines. There is a great deal of controversy as to which truck is better—however, studies made of these two types indicate that many of the difficulties once experienced with both types have been overcome.

Generally speaking, the use of gasoline-powered trucks may be said to be advantageous under the following conditions:

- Long hauls with sustained operation.
- Intermittent or periodic operation where the truck must stand idle for long periods of time.
- Uneven floor surfaces.
- Long, steep inclines.
- Outside operation.

The use of electric-powered trucks may be said to be advantageous under these conditions:

- Frequent changes of direction and short hauls.
- Closed areas where fumes and noise are objectionable.
- Continuity of operation.
- Ideal floor conditions free from steep or long inclines.
- Continuous use over a long period of time.

Modern developments have eliminated some of the differences between the gasoline and electric trucks. Many companies use electric trucks outside with considerable success. Steep ramps are being cut down for safety's sake and for easier trucking. There are mufflers which claim to remove a great deal of the noise and the toxic carbon monoxide from the exhaust fumes of the internal combustion engine.

Of the electric truck and the internal combustion engine truck, it can be said that each will do things the other will not do, but the spread between the capabilities of the two has been decreased by scientific advancement.

Service Available. One of the most important points to be considered when buying any type of equipment

Comparative Efficiency of Truck A and Truck B		
	Truck A	Truck B
Miles traveled	8.29	4.73
Number of trips one way	717	500
Total ton-miles	10.24	4.73
Average hourly cost for truck (driver excluded)	\$0.38	\$0.3212
Truck cost for 6-hour test (driver excluded)	\$2.25	\$1.93
Cost per ton-mile	\$0.220	\$0.407

Summary of Gain of Truck A over Truck B

	Per cent
Net payload	23.5
Number of cycles	43.3
Number of lifts	43.5
Average time per cycle	30.3
Time to lift load	25.0
Time to lower load	39.4
Total time, lift and lower	30.2
Total feet lifted	43.3
Foot-pounds lifted	77.0
Miles traveled	75.2
Foot-pounds	51.2

that requires servicing is the service and parts facilities that are available. If two fork trucks are being considered, and their characteristics are pretty much the same, the manufacturer who offers the best service facilities should get the business. One method for checking on the availability of parts is to pick out some basic parts and find out where they are stocked for the truck being considered.

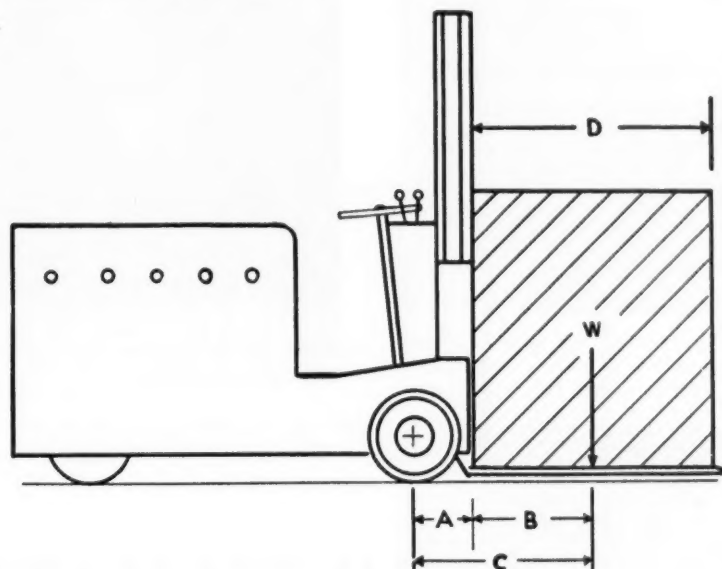
If the user does his own service work, the parts check should be sufficient. If not, the locations of service facilities should be checked to determine where authorized service can be obtained. In large cities, most manufacturers maintain depots with auxiliary or standby equipment available.

Standardization Within the Plant. Standardization, as considered here, means the buying of similar models of the same make of truck.

Some advantages of standardization within the plant are: (a) minimum spare part inventory may be kept; (b) maintenance men will become skilled on general upkeep and emergency breakdowns; (c) operators will be able to handle trucks more efficiently as compared to changing from one type to another; (d)

(Continued on page 138)

PROCEDURE FOR COMPARATIVE RATING FOR FORK LIFT TRUCKS



Some manufacturers specify a number of pounds capacity with a particular length of load while others specify a number of pounds capacity at a given number of inches from the heel of the fork. Some give an inch-pound rating based on the distance of the load center from the heel of the fork, while others base their inch-pound rating on the distance from the center of the load to the center of the front axle.

Here is one method of comparative rating:

With reference to the accompanying sketch, the symbols are interpreted as follows:

A = Distance from center of front axle to heel of fork measured in inches.

$B = \frac{D}{2}$ = Distance from heel of fork to center of load measured in inches.

C = A + B = Distance from center of front axle to center of load measured in inches.

D = 2 × B Length of Load

W = Weight of load measured in pounds.

In order to calculate a load with a length other than that specified by the manufacturer, or to compare one truck with another of a different rating, it is necessary to obtain the "Inch-Pound Rating". The Inch-Pound Rating is W, the rated load; multiplied by C, the distance from the center of the front axle to the center of the load, i.e.

$$\text{Inch-Pound Rating} = W \times C$$

The inch-pound rating becomes a constant for that particular truck. Then, in order to figure (1) the maximum load length for any given load; or, (2) the maximum load for any given load length, the formula can be reversed to give this information, i.e.

$$(1) C = \frac{\text{Inch-Pound Rating}}{W}$$

$$(2) W = \frac{\text{Inch-Pound Rating}}{C}$$

Example: A truck has a rating of 4000# @ 30"—which means a 4000# load which has its center 30" from the heel of the fork. The specifications show the distance from the center of the axle to the heel of the fork to be 15". By applying the formulas, the inch-pound rating may be arrived at:

$$C = A + B = 15 + 30 = 45"$$

$$\text{Inch-Pound Rating} = W \times C = 4000 \times 45 = 180,000 \text{ inch-pounds}$$

The rating of 180,000 inch-pounds then becomes a constant for the truck in question. Then, to learn how long a pallet or skid which will have a gross weight of 2500# can be made, by applying the formulas:

$$C = \frac{\text{Inch-Pound Rating}}{W} = \frac{180,000}{2500} = 72"$$

$$B = C - A = 72" - 15" = 57"$$

$$D = 2 \times B = 2 \times 57"$$

$$= 114" \text{ allowable load length}$$

Or, as another example, it is desired to know the maximum safe load for a standard 84" rack, by applying the formulas:

$$B = \frac{D}{2} = \frac{84}{2} = 42"$$

$$C = A + B = 15" + 42" = 57"$$

$$W = \frac{\text{Inch-Pound Rating}}{C} = \frac{180,000}{57} = 3158\# \text{ gross weight allowed.}$$

Here's a host of handling hints for firms having processes that are hot, dusty or otherwise disagreeable.



HOT COILS from rundown mill for reducing metal are discharged to turnover which carries them to slat conveyor on end position.

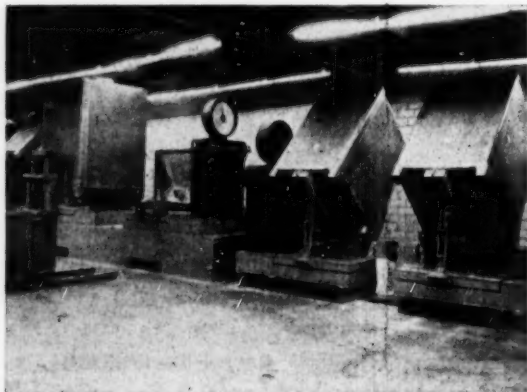
Easier Handling of **"HARD-TO-HANDLE"**

REDUCTION of personal danger, control of air pollution and protection of equipment go hand in hand with the development of efficient material handling methods in many industries. This is true whether the material handled is a hot metal, chemical or drug—any substance that might involve elements of safety, health or comfort for production personnel.

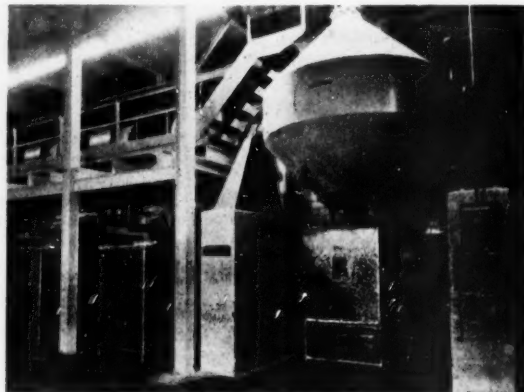
The more nearly automatic the process of handling such materials, the smaller the number of workmen

exposed to hazards. When the material is dry and finely powdered, efficient handling methods reduce the need for recovery of dust. More effective quality control is also a consequence of methods that reduce danger and waste.

Many types of devices are used for such handling jobs. They include continuous conveyor systems, zipper conveyors and steel bins for powdered chemicals; fiberglas and chemical-resistant belts; hoses that resist



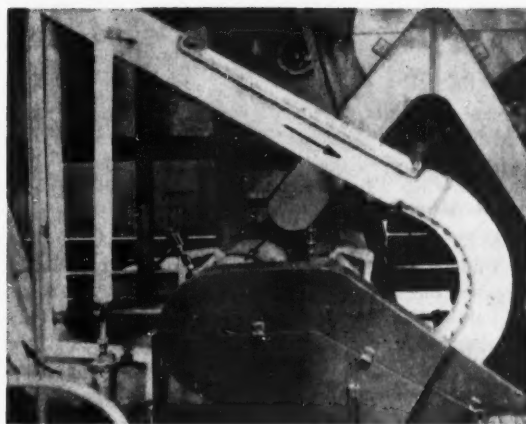
POWDERED CHEMICALS are handled by steel bin, which replaced 20 fiber drums, at General Electric Company. Bins shown on tilting discharge receivers.



STEEL BINS being filled with powdered chemicals from blender. Bins are discharged through hinged door on lower part at one side.



FRAGILE BEADS of pelltized carbon black are carried by zipper belt conveyor. Pellets are then discharged through a distributing screw conveyor.



FLAKES of soy beans were difficult to handle at Sioux Industries, Inc., but a continuous flow enclosed conveyor system has been the key to the problem.

MATERIAL

alkalies, acids and solvents; pumps made of special alloys; electrically heated vibrating screens to prevent screen blinding by moist material; automatic conveying systems for hot metals, and many others.

Handling Powdered Chemicals

Increased efficiency, elimination of dust and greater quality control resulted when General Electric Company, in Cleveland, substituted steel bins for fiber drums in bulk handling of finely powdered chemicals.

The company had used 4-cubic-foot drums to transfer the chemicals to and from the processing equipment. In some instances, because of the low capacity of the containers, it was necessary to shovel the chemicals into them from shallow boxes large enough to accept cascade discharges from certain types of equipment.

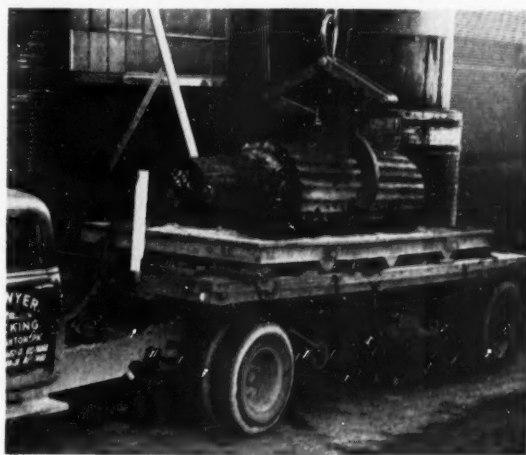
One steel bin, with a capacity of 4400 pounds, replaced 20 fiber drums. Weighing 233 pounds, each bin is 5 feet 9 inches high, 4 feet long and 3 feet 6 inches wide. Standing on 4-inch legs, the bins are constructed for stacking.

They are used to transport material between processing, storage and blending. Bins containing the chemical are weighed by moving them with lift trucks onto platform scales equipped with tilting discharge receivers. Discharge screws on the tilts are controlled by switches on the scale heads. The motor drive is shut

(More on next page)



SLUDGE AND DROSS are removed from magnesium alloying furnaces by a special scoop type attachment on a fork truck at Dow Chemical Company.



TO SHIP HOT METAL, an insulated container is used on truck at Heppenstall Company plant. Automatic tongs lift and position the ingot.

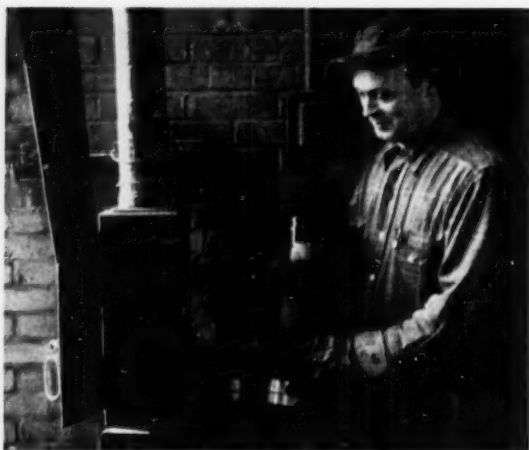
"Hard-to-Handle" Material

off automatically when the pre-set weight of the material has been discharged. The bin discharges through a hinged door on the lower part of one side.

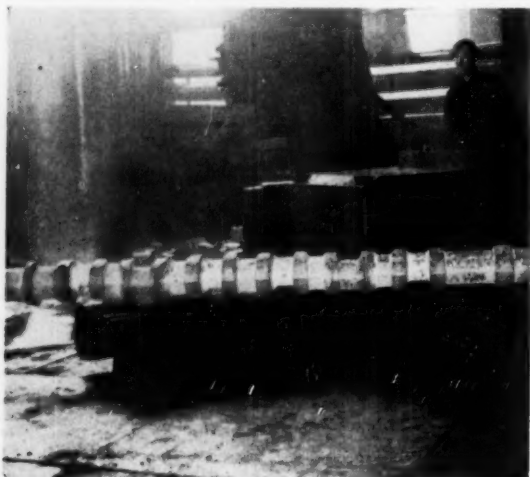
Uses Aluminum Bins

In handling phthalic anhydride, used by Falk & Co. of Pittsburgh in its preparation of lubricating oils and greases, the company has installed aluminum bins of 74-cubic-foot capacity and similar construction. The bins are either emptied or stored. When they are discharged they are moved onto scales, which are set by the operator for the desired amount of contents that fall into kettles on the lower floor.

Prior to the installation of the bins, the phthalic



BENZOL, toluol, other inflammables carried by pneumatic tube between the benzol plant of Wierton Steel Co. and laboratory, about a tenth of a mile apart.



RED HOT crankshaft handled by low lift platform truck in a forge shop. Corrugated top of the skid is designed to secure the load during travel.

anhydride was handled in paper bags. The bags were unloaded, or transferred to the second floor of the mixing building. The bags had to be ripped open and dumped by hand. Not only was this process costly in terms of labor, but frequently the bags became wet and broke open. Breakage and sifrage caused product losses as high as 5 per cent.

The problem of handling pelletized carbon black in the form of fragile beads about the size of sugar crystals was solved by the B. F. Goodrich Company of Akron with the installation of a zipper belt conveyor.

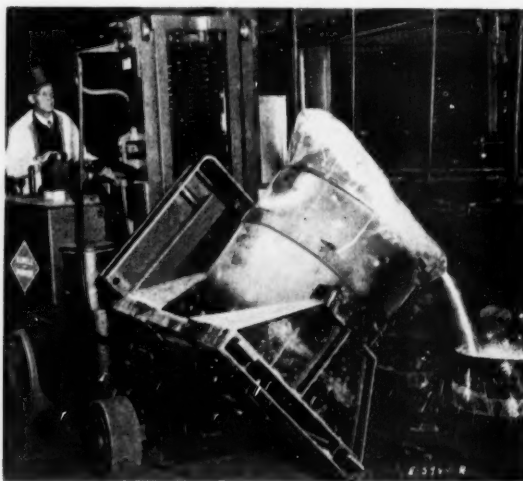
When the company tried to use one type of conveyor, the fragile carbon beads were crushed, clogging the system and reducing the capacity of the conveyor. The material was purchased in bags, transported to mixers, opened and dumped—a dirty, disagreeable task.

Now, the material arrives at the plant in hopper-bottom flat cars with a capacity of 65,000 pounds. The black is discharged to a short screw conveyor, fed into a zipper and carried to a distributing screw which feeds it into steel storage tanks.

Continuous Flow Conveyors

An enclosed continuous flow conveyor system is the key to the problem of handling soy bean flakes in the solvent extraction of soy beans at the Sioux Soya Mills division of the Sioux Industries, Inc., Sioux Falls, S. D.

Flaked beans are carried from the flaking roll discharge conveyor to an inclined continuous flow conveyor. Power driven, this type of conveyor is designed to carry bulk material that completely fills the conduit and surrounds the endless chain and flights. Particularly gentle in handling, it is not used if material contains hard lumps or is actively abrasive.



METAL is poured by ladle held on pallet handled by fork truck equipped with rotating head. Pallet has sleeves at either end for entry of forks.

Continued

In a conduit 7 inches square, the conveyor runs 7 feet horizontally before beginning a 57-foot run on a 27-degree slope. The flakes then are discharged into a 7-inch horizontal type, which runs 116 feet to the extraction building.

With temperature determining the handling characteristics of the flakes, the conveyor is warmed by steam pipes along the side walls and is heavily insulated.

Flakes are delivered to the extraction building at a rate of 4 tons an hour.

Because the extraction solvent is highly inflammable and volatile, great care is exercised to prevent its escape. At one danger point, where the spent flakes are moved to the desolventizer-toaster, the conveyor is sealed with pressure-tested casing.

High purity of anti-anemia and vitamin B2 powders require particularly careful handling at the Eli Lilly Company in Indianapolis.

A continuous flow conveyor system is used. Raw material is chuted to a mill that feeds directly into the conveyor, which rises 45 feet before traveling 16 feet horizontally to a cross conveyor that feeds fat extractors. Another horizontal continuous flow conveyor picks up the material from the extractors and feeds the pulverizers. These discharge to a horizontal continuous flow conveyor and to a battery of driers. There, the material is carried to a special loop boot type of continuous flow conveyor, which elevates the material to a scale.

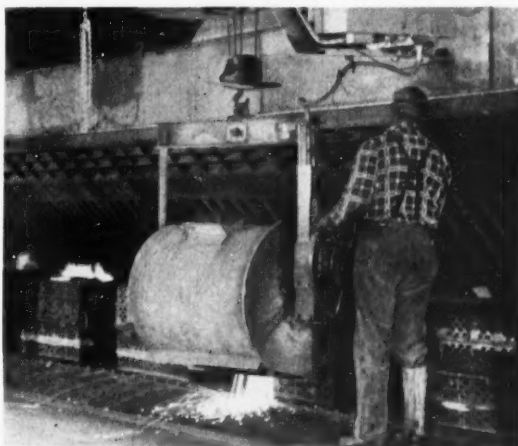
A bin level control in the scale feed chute shuts off the conveyor system when the material builds up at the scale.

The material finally reaches a battery of ribbon mixers by way of other continuous flow conveyor units,

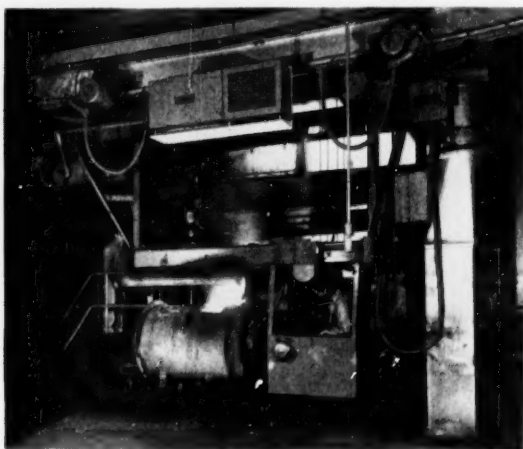
and is again automatically weighed with the aid of another bin level control.

The entire conveyor system in this Eli Lilly building consists of 5-inch units with capacities of 850 to 8000 pounds an hour. Chain speeds range from 3 feet to 45 feet a minute for material ranging up to 45 pounds a cubic foot.

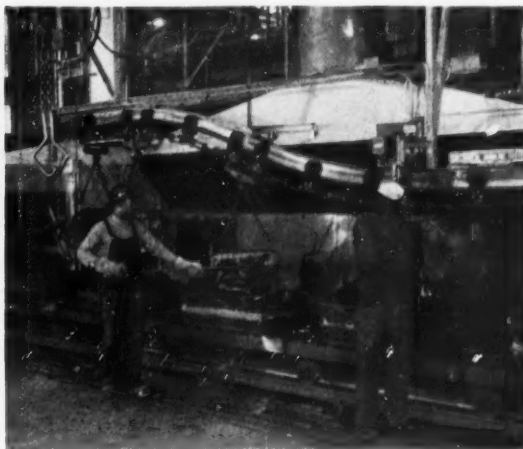
Nine continuous flow conveyor units handle 1100 cubic feet of soap chips a minute at the soap and cosmetics plant at Cruzellos y Compania, Havana, Cuba. These are also used to insure purity and cleanliness. There are dust-tight casings on the conveyor system and a dust control system at the loading point.



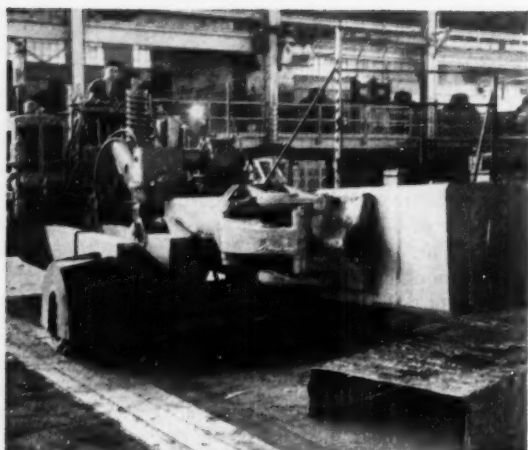
POURING LADLES at Ford foundry, electrically driven, are suspended from tramrail loop system. Each pouring station loop extends 600 ft. along molding line.



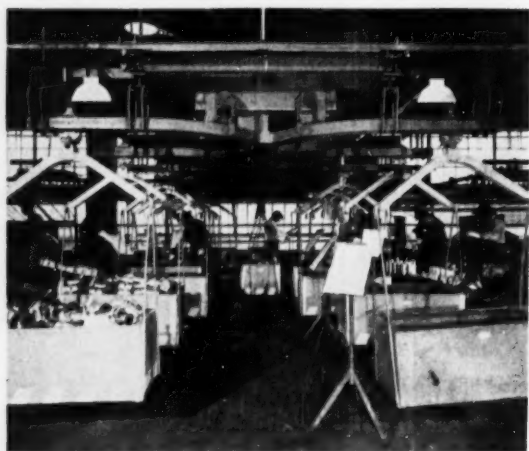
MOLTEN IRON is picked up from ladles at continuous flow cupolas in Ford Motor Company foundry by 2-ton transfer ladles suspended from overhead tracks.



HOT CASTINGS are pulled from drags as chain conveyor on monorial, in Ford foundry, as it dips and rises. Worker is shown fastening hooks on a casting.



HANDLING HEAVY aluminum ingots at Alcoa foundry to prevent marring is accomplished through use of a specially designed, truck-mounted manipulator.



BUCKETS OF CASTINGS, filled from mold machines in permanent mold foundry of Alcoa, are pushed short distance, then taken over by power conveyor system.



OIL FILLED tub, weighing 2,000 pounds, is carried by "walkie" truck from oil station to any one of 45 mixing vats at Armstrong Paint and Varnish Works.

"Hard-to-Handle" Material

Continued

Vacuum and gravity are combined in the automatic handling of alum and lime at the Nottingham Filtration plant of the Cleveland water system. With a nominal capacity of 100,000,000 gallons a day, the plant handles 700 tons of alum a year for water treatment.

Both alum and lime are shipped in covered hopper bottom cars—50 to 60 tons of alum to the car—onto a covered siding alongside a receiving platform.

A gate slide on the bottom of the car is opened and a collector, 1 foot wide and 2½ feet long, is fastened to the car over the opening. This is attached to a 6-inch hose, which is connected with a nozzle on a suction line from which air is exhausted by a 50 horsepower blower on the seventh floor of the chemical treatment building.

On the sixth floor of the building is a series of loss-in-weight gravimetric feeders, including two for carbon black, two for lime slakers and three for the alum.

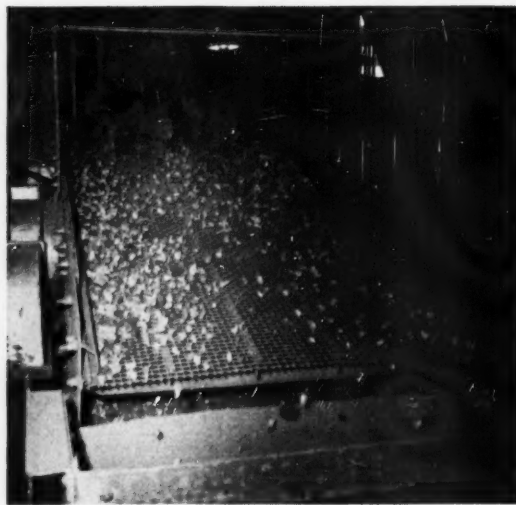
Each of the lime and alum feeders is equipped with a 10,000-pound feed and scale hopper. Above each hopper is a circular steel storage bin with a capacity of 214 tons. All feeders use over-and-under feed alarms and recorders which indicate the amount of the material remaining in the hoppers.

On the sixth floor, the alum storage bins are interconnected by a screw conveyor at the bottom so that the alum may be taken from any bin to any alum feeder.

Material in the feeders drops into steel dissolving tanks where it is agitated with water, then dropped into the raw water channel which is connected with the settling basin.

Each of the lime feeders is equipped with a slaker, a screw conveyor for removing impurities from the

(Continued on page 129)



SEPARATING COKE of various sizes at Cleveland steel plant, vibrating screens are electrically heated to prevent blinding due to moisture in the material.

Significant Developments of 1953

By Howard M. Palmer

During 1953, shipments of material handling equipment increased over 1952, top management gave handling more consideration, several mergers of equipment companies were announced and the shortage of trained manpower at all levels was a problem to both manufacturers and users. The latter, despite several MHI activities directed toward solution.

The industry's volume has reached 1¼ billion dollars worth of material handling equipment—conveyors, pallets, steel strapping, hoists, cranes, monorail systems, skids, tote boxes, elevators, wheeled floor trucks, electric and gasoline powered industrial trucks. (About one dollar of material handling equipment for each 100 dollars of manufactured products.) All have helped reduce the costs of and made possible the more efficient production of 103 billion dollars worth of manufactured goods plus the warehousing and distribution of these goods.

Material handling, as a well organized science of management, has assumed a larger role in progressive industries. It has launched out into entirely new fields such as restaurants, retail grocery stores, department stores and hotels.

Top management is changing its attitude toward material handling because it now realizes the increased production and lowered costs that can be obtained by overall integration. Only a few years ago, material handling was the part-time responsibility of a busy production superintendent with limited access to top management. More and more, now we find the material handling function being exercised by a vice president with a voice in top management decisions, with full power and responsibility to integrate material handling with accounting, purchasing, warehousing, plant layout, tool design and maintenance.

A trend toward mergers of material handling equipment manufacturers characterized 1953. A manufacturer of electric trucks for inside work expanded its line to include gasoline powered vehicles and acquired another company to offer equipment for outside handling. Another industrial truck maker bought out a manufacturer of straddle-type equipment and a power shovel company. A conveyor manufacturer purchased a gasoline fork-lift truck company. Many other companies in the industry expanded production by building new plants or adding to existing ones.

* H. M. Palmer was president of MHI in 1953, and is now on the board of directors.

One of the outstanding industrial events of 1953 was the 5th National Material Handling Exposition sponsored by the MHI. Held in Philadelphia this year, the exposition was the largest industrial show in 1953 with more than 300 exhibitors occupying 170,226 sq. ft. of space. During the five-day show, more than 20,000 persons attended.

Following the successful conclusion of the 1953 exposition, W. E. Schirmer was appointed Chairman of the exposition committee. Meetings were held with large groups of exhibitors and plans formulated for future shows. Based on results of a questionnaire circulated to all MHI members who exhibited in 1953, the next Material Handling Exposition is now contemplated for 1956.

Leasing and renting of material handling equipment became more widespread in 1953. Long-term financing of the outright purchase of equipment also had the effect of expanding the markets for equipment.

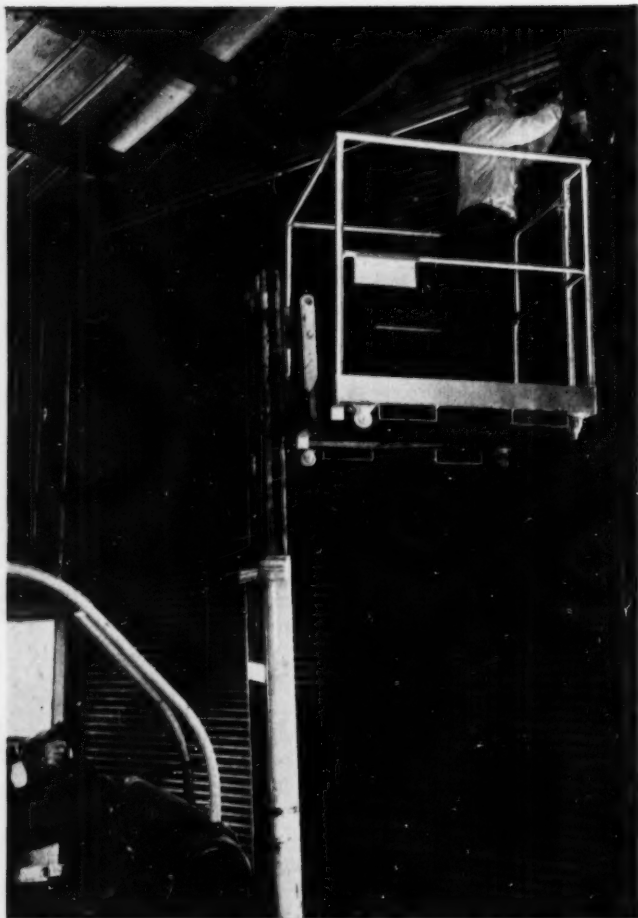
The increased use of electronics in the control of conveyors, pallet loaders and packaging equipment became more general, pointing the way toward more complete automation at some future date.

One of the needs for the future of both manufacturers and users of handling equipment will be trained man-power on all levels. In the next few years users will have to find many thousand more qualified men to operate new industrial trucks. More will be required to supervise, service, maintain and repair just this one type of equipment. The additional man-power that will be required for all types of handling equipment cannot even be estimated.

Manufacturers will need more trained engineers than are now available to design, build and sell the tools of material handling.

A major part of the program of the MHI in 1953 was devoted to education at all levels. It embarked on a program of organizing conferences slanted specifically by subject and caliber of participant to top management. Our Industry Educational Committee published a series of booklets for professors, engineers, students and consultants. MHI cooperated with the AMHS in supporting efforts of the College Industry Committee for Material Handling Education. More than 55 colleges now offer courses in material handling and a few have complete curricula.





▲ **HIGH UP**, repairman works on safe platform supported by tork truck. A 42 inch "cube," this unit allows four-way fork entry, has hinged gate at one side, is mounted on rubber casters for easy rolling.



▲ **CLEANING** floors and inaccessible places of scrap and stray parts is easy with magnetic sweeper shown being wiped by ring that pushes material to unmagnetized end. It reaches difficult areas.

◆ **WORKED IN EXTREMELY DIRTY CONDITIONS** at steel fabricating plant, tractor with front end loader has been equipped with filters in hydraulic components to keep fluid clean, protect against possible damage.

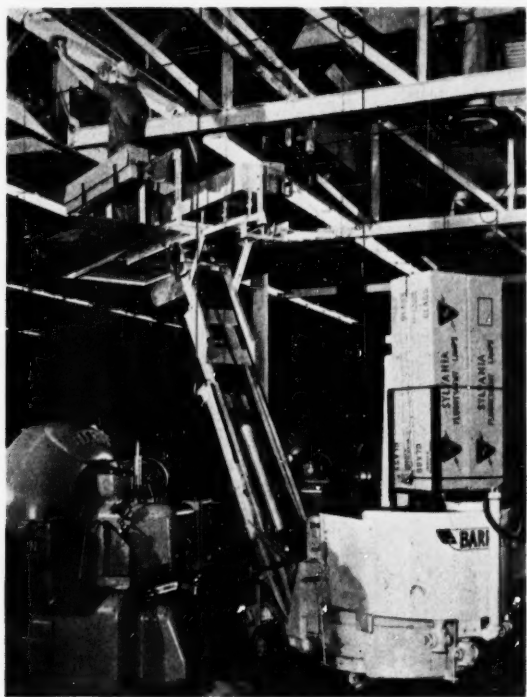
Tips For

Some representative examples show how material handling and maintenance devices help in care, repair and protection of plant equipment, including handling equipment itself.

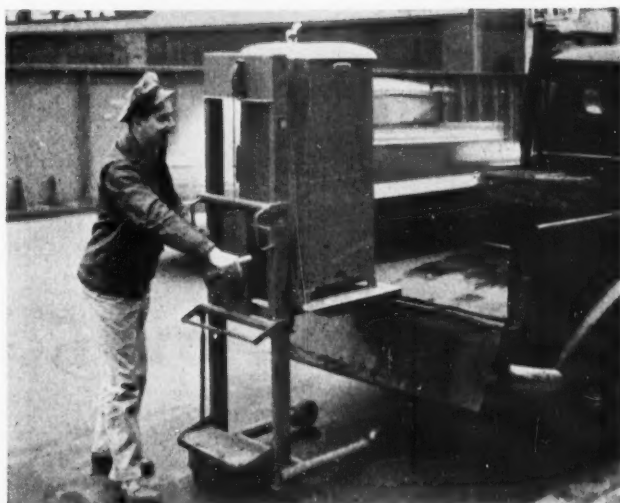
Maintenance



▲ **HIGHLY MANEUVERABLE** mobile cranes are doing host of maintenance and repair jobs, both in crowded factories and yards. Here one removes wheels from rail car at American Car and Foundry Co.



▲ **BATTERY POWERED** lift, push-button operated by one man, raises up to 12 ft. 8 in. In one plant, replacement and cleaning lamps takes one man 10 minutes where formerly two men required an hour.



▲ **EASY HANDLING** of replacement parts is possible by portable elevator which lifts up to 1,000 lbs. The versatile device may be fitted with platform, lifting arms, or platform of cradle or roller types.



▲ **HAND-OPERATED** industrial sweeper (above), has rotary brushes which deposit litter in collecting hopper. One man quickly covers big area. Power-operated, riding type sweeper (below), cleans 36-in. path at six miles per hour, indoors or outside; accumulates 700 pounds, can be emptied in 30 secs. ▼



● With a "batch" type production, involving a great many operations, coordination of overhead and floor truck handling can . . .

Keep Flow Routes Untangled

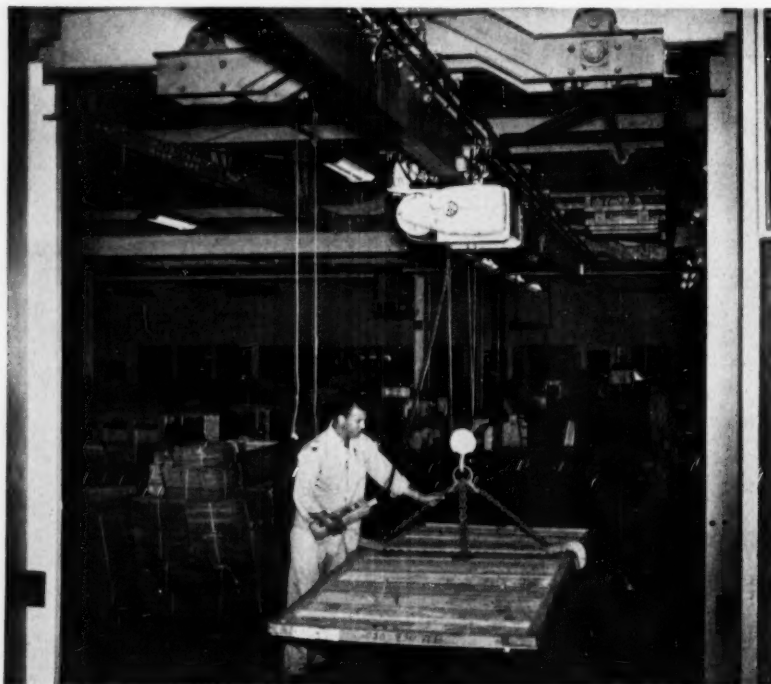
"CREATE THE SHORTEST POSSIBLE travel time between processing departments."

This directive from executives of the Miller Dial and Nameplate Company was the measuring stick applied to every step in the development of plans for their new plant and office in El Monte, California. Its urgency stemmed from the experience which the company had been undergoing for the past five years. Rapid growth from a city-wide to a nation-wide business within that short period had so over-taxed the facilities of the building—and so tangled the flow routes of materials going through the old plant—that the need for correct flow planning became of prime concern to the management.

The slightly rectangular shape of the new one-story plant, with truck docks located on one of the longer sides, at dead center of the perimeter of processing

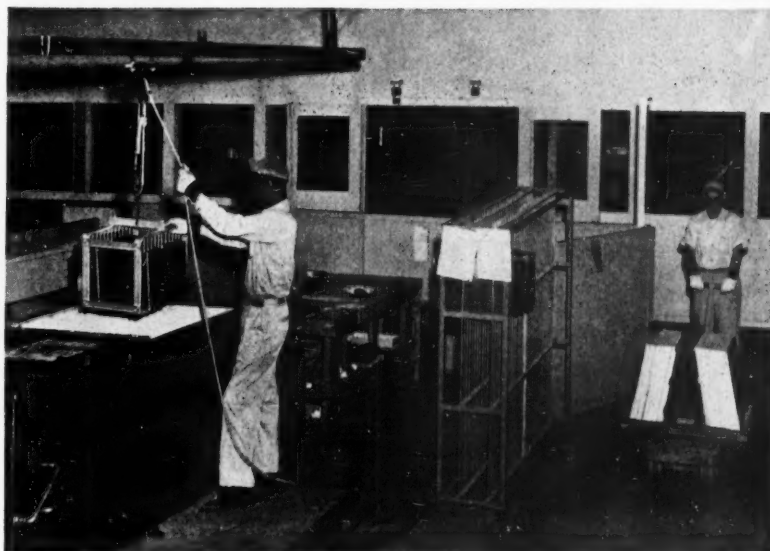
activity, indicates that the planning directive was followed. Because the company is principally in the business of printing on metal or plastic, practically no stock of raw materials is kept on hand in the new plant. Therefore a comparatively small storage or staging area has been provided adjacent to the docks. All materials in the plant belong to customers, are in the plant for printing, and are routed through and shipped out again as quickly as possible.

A half-ton capacity underhung hoist on a transfer monorail system passes the sheet plastic or metal stock from truck beds, across the dock, around the corner, and out onto the storage floor. (This type of loading equipment is used because the storage room runs parallel to the dock.) The material is then transferred from the monorail to the crane to pass into the storage area. Incoming material is then stacked six to eight feet high in metal bins.



LOADING DOCK, at dead center of perimeter of processing activity is served by transfer monorail system and crane, which passes incoming stock onto storage floor and then from stacks to the shear department in the same room.

STILL IN STORAGE room, sheets are buffed, degreased and racked onto "A" frames on skids to be handled by hand lift trucks as they start travel among the numerous but compactly and efficiently arranged processing steps.



A second purpose served by the crane in the storage room is the transfer of the metallic sheets from their stacks to the shear where they are cut to size. Still in the same room, the material is then buffed, degreased, and racked onto "A" frame trucks for delivery across a 10 foot hallway into the printing department. There, it is intercepted by the order from the front office and processing begins accordingly.

Meanwhile the design to be imprinted on the metal or plastic has been received by the printing department. This is photographed, reduced to size, negatives and positives are made, and the resulting reproduction material sent to the second dark room (still in the same department) where lithographic composed press plates are made.

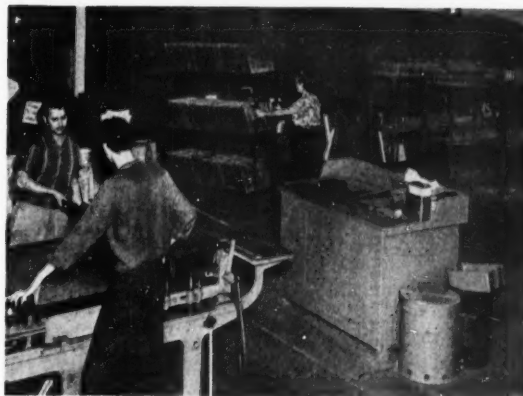
A 56 foot baking oven in the next room completes the printing process, and the "A" truck moves the work down the hallway to the punch press department.

If the work is to be etched before being punched, a short stopover at the etching room is made. From there the material is trucked to the paint room, adjacent to the etching department, where the colors are sprayed, baked, and scraped from the face of the letters.

The work then again crosses the narrow hallway to the punch-press department for blanking out to size and shape required, and from there is hand-trucked through one doorway to the adjoining shipping room. It is then crated, inspected, and trucked out the shipping door, across the dock, and into the truck beds.

The entire operation is characterized by movements of never over a few feet between each of a maximum of around thirty separate processes. Not all work is sent through all processes, but the centralized location of the shipping room and the easy access from there to all departments allow the material to be smoothly routed through the plant regardless of the number or order of processes required.

This plant was constructed by Mac Isaac and Menke Company, general contractors of Los Angeles.



AFTER TRAVELING only 10 feet from storage room to printing department, sheets are printed and delivered out on easy-rolling, protective rack trucks.



ENTERING punch press department, load of metal sheets has been wheeled down the hall a distance of only 18 feet from the printing department.

In-and-Out Warehousing Designed for "Tomorrow"

This distributing firm knew where it was going, and installed handling equipment that would take care of all anticipated requirements.

PLANNING FOR FUTURE EXPANSION of distribution activities, Dial Shoe Co., Inc. had a new warehouse on paper when sales engineers from Fred Hill & Son Co. were called in to advise on handling equipment.

At that time the shoe company had 24 stores operating in the Delaware Valley area, four more in the process of construction, and a total of 50 in mind.



FLOW'S GUEST EDITOR

INTRODUCING . . . Kenneth (Ken) Shaw, FLOW'S second Guest Editor and the owner of Fred Hill & Son Co., material handling distributing firm headquartered in Philadelphia. Established over 50 years ago as a stamp & stencil business, the firm started to carry casters and hand trucks in the late thirties. In '39 the original owner died, and Ken Shaw bought the company. Today, after several moves to accommodate growing activities, lines and stocks, the firm is established in its own building with 30,000 sq. ft. of storage area, display, service and office space. Its salesmen are specialists qualified to serve in consulting and engineering capacities. Fred Hill & Son Co. is a Franchised FLOW Distributor.

The warehouse was to be equipped to handle the requirements of this total.

In early stages, contemplated equipment included a series of gravity and belt conveyors to handle cartons of shoes, handbags, and so forth, throughout all phases of receiving, warehousing and shipping.

To the material handling engineers making the initial survey, the proposed system appeared to have some definite disadvantages. For one, conveyors running the length of warehouse aisles, between storage racks, would obstruct the free movement of material, particularly in cross aisles. For another, the use of gravity made it difficult, if not impossible, to reverse the system, if desired, for shipping purposes. And speed of handling could not be well controlled.

Bill Ford Jr., Fred Hill's conveyor specialist, and Ben Graff Jr., sales engineer, then proposed an alternate system, essential elements of which were an overhead cable conveyor for internal handling and a short section of skatewheel connecting it directly to highway carriers. The owner of Dial Shoe, Abram L. Spector, and his general manager, Charles Young, were quick to see the advantages in this proposal. It would cost less than the system they had considered, and the overhead conveyor would leave clear floor space in all aisles—thus contributing not only to faster handling but also to safety and easier housekeeping. The system was reversible, and its speed could be varied as desired. Accompanying illustrations show how well the planned material flow was achieved.

In picture (1), cartons of shoes are being unloaded from a highway truck directly onto standard wheel conveyor sections. These flow by gravity to a special pick-up section shown in picture (2). The section was designed especially for this application by Kenneth Shaw, owner of Fred Hill & Son Co., and made by the firm—as were the carriers which pick up cartons and start them toward storage via the cable conveyor.



1. **CARTONS ARRIVING** on highway carriers are loaded onto standard wheel conveyor sections, then flow by gravity into warehouse and to pick-up station.



2. **TRANSFER** from wheel to overhead conveyor takes place automatically in pick-up section as hook-like carriers lift cartons and start them to second floor.

In picture (3) is a view of the second floor, main storage area from the point where the conveyor emerges. Cartons are removed from carriers and placed in proper sections according to numbers marked on them when they are checked in on the first floor. Empty cartons are placed on the floor for use in packing orders to be shipped to individual stores.

Picture (4) shows how the sealing and labelling have been expedited during shipping. The platform truck (also a Fred Hill production), designed to eliminate as much lifting and turning as possible, has a built-on shelf to hold a tape dispenser handy for the operation.

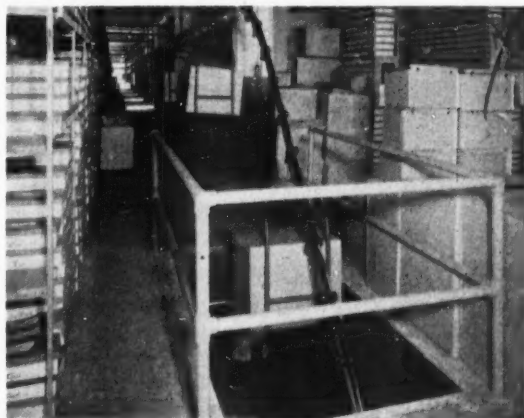
Flow Route in One Direction

While the system can be reversed for shipping—with the special pick-up section of the skate-wheel line serving as an automatic unloader—experience has shown it is more efficient to ship and receive concurrently, with the overhead conveyor going in one direction. As it circulates through the aisles of storage racks, cartons of goods can be removed from the line at proper stations while, at the same time, orders for stores can be placed on carriers. They then pass through the sealing and labelling station on the truck (which can be located at any convenient place) and then go down to a waiting truck at another door on the ground floor.

Although designed for this particular operation, minor alterations—easily accomplished because of the flexibility of the system—make it ideal for many warehouse and manufacturing processes.

4. **FOR SEALING AND LABELING**, platform truck minimizes lifting and turning, has built-on shelf which keeps tape dispenser readily available at all times.

3. **CLEAR FLOOR SPACE** in aisle shown from point where conveyor arrives at second floor. Cartons are marked during receiving for storing by number.



BEFORE

PICK-UP TRUCK, running back and forth, and pulleys comprised lifting rig for bags received in highway trucks. Six men took five hours to unload trailer.

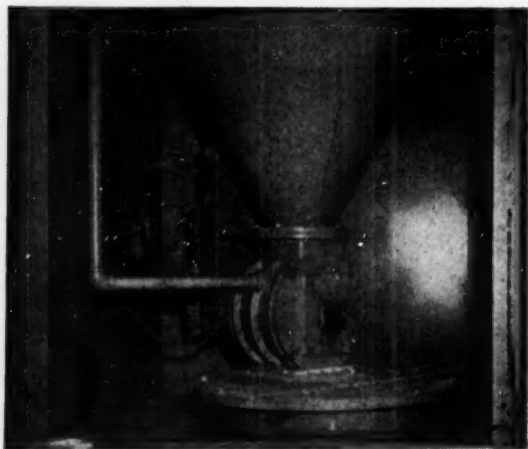
AFTER

HOSE of air-activated conveyor now empties boxcar load of 30 tons in nine man-hours. Material, from one inch diameter to powder, is sucked up to fill silo.

Pneumatic Handling of Bulk Chemical Saves 29% Per Ton

You don't have to be a big user of process ingredients to get the economies of bulk purchasing, shipping and handling.

REQUIRED TO HANDLE a total of only 241 tons per year, a new pneumatic conveying system (plus storage silo), installed at a cost of \$9,000, is expected to pay for itself in five years—running at but 25 percent of capacity.



The amortization period could, of course, be shortened considerably by a firm having greater demands, for efficiency of operation would increase with consumption of material. And the principle is applicable regardless of the type of process bulk required.

Old Method Ingenious But Uneconomical

At the Water Plant of the City of Batavia, N. Y., pebbled lime formerly was received in bags transported by highway trailer. Bags were then palletized in the truck and hoisted to the second floor for storage. A pick-up truck, running back and forth, and a set of pulleys comprised the lifting rig.

With this arrangement it took six men five hours to unload one trailer—a total of 30 man-hours. The bags were then rehandled from the storage room to where the material was induced into the water system.

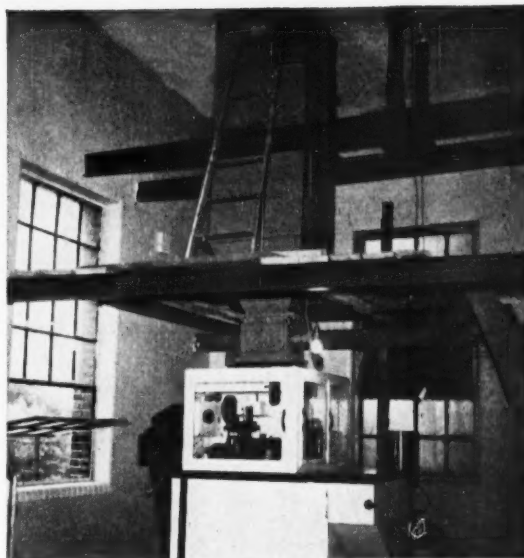
ROTARY DISCHARGER (bottom) moves material from secondary separator, via attached cone, to fill silo without loss of essential vacuum.

CONVEYED to primary separator on roof of main plant building, material then drops into day bin (at top of picture) for introduction to belt-type feeder.

New pebbled lime is received in 30 ton boxcar loads, which are emptied in nine man-hours. Boxcars are used to keep it from absorbing moisture to any great extent. The size of the particle varies from 1 inch in diameter to powder. To store the material, a silo was installed. It is 40 feet high, with 120 tons capacity for the lime.

The method used for removing the material from the boxcar to the silo is very similar to a vacuum system. A 25 foot length of conveyor hose with a conveyor nozzle is used to suck the lime up into the secondary separator and then drop it into the silo.

The conveyor nozzle consists of two sections of pipe, one slid inside the other, with the inside section adjustable. The air passes down through the top part of the conveyor nozzle, through the outside pipe and makes a complete 180 degree turn, passing up through the inner pipe. As the air makes the turn, it picks up the material and carries it through the 4-inch diameter conveyor hose and cast iron pipe with long turn bends to the secondary separator, which is located on the roof of the silo. The secondary separator has filter bags which filter out any material that is not separated in the cyclone effect in the bottom of the separator. The vacuum line runs directly from the secondary separator down to the exhauster, which is

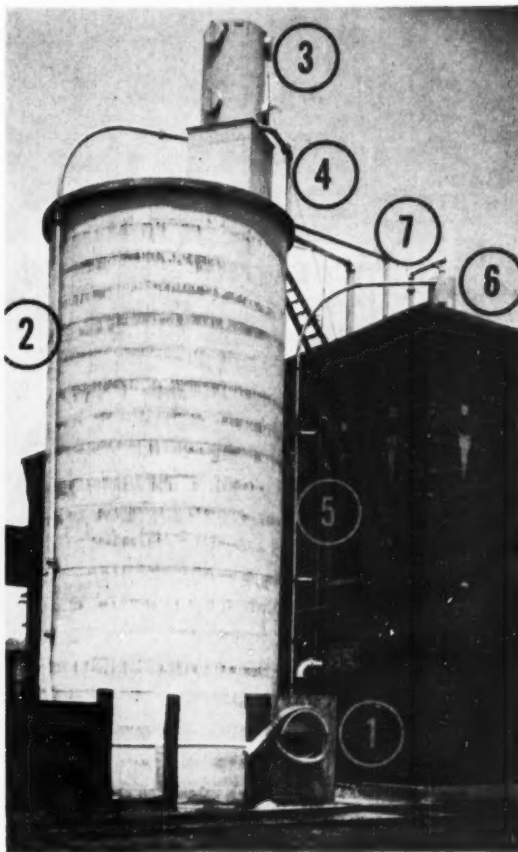
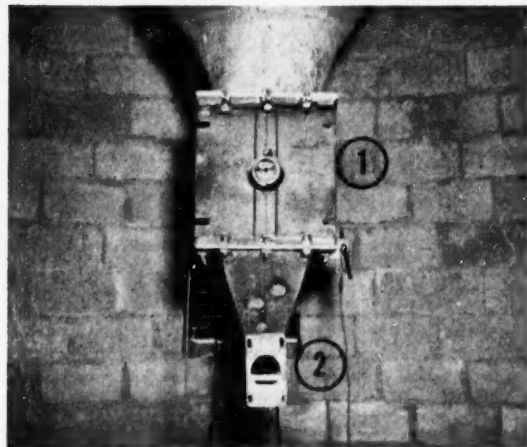


located in the ground floor of the building. Material is discharged from the secondary separator into the silo by means of a rotary discharger. The function of the rotary discharger is to remove the material from the separator to the silo without destroying the vacuum seal in the separator itself.

(Continued on page 128)

RIGHT: Principal elements in pneumatic conveying system—(1) Storage rack for conveyor hose and nozzle; (2) Pipe line carrying material to secondary separator; (3) Secondary separator; (4) Rotary discharger (housing); (5) Line connecting silo and primary separator; (6) Primary separator; and (7) Return line to blower.

BELOW: At bottom of silo are (1) valve and (2) vacuum feeder. Valve is drum type unit adjustable to control amount of material flowing into feeder.



Continuous Flow from Casting through Shipping

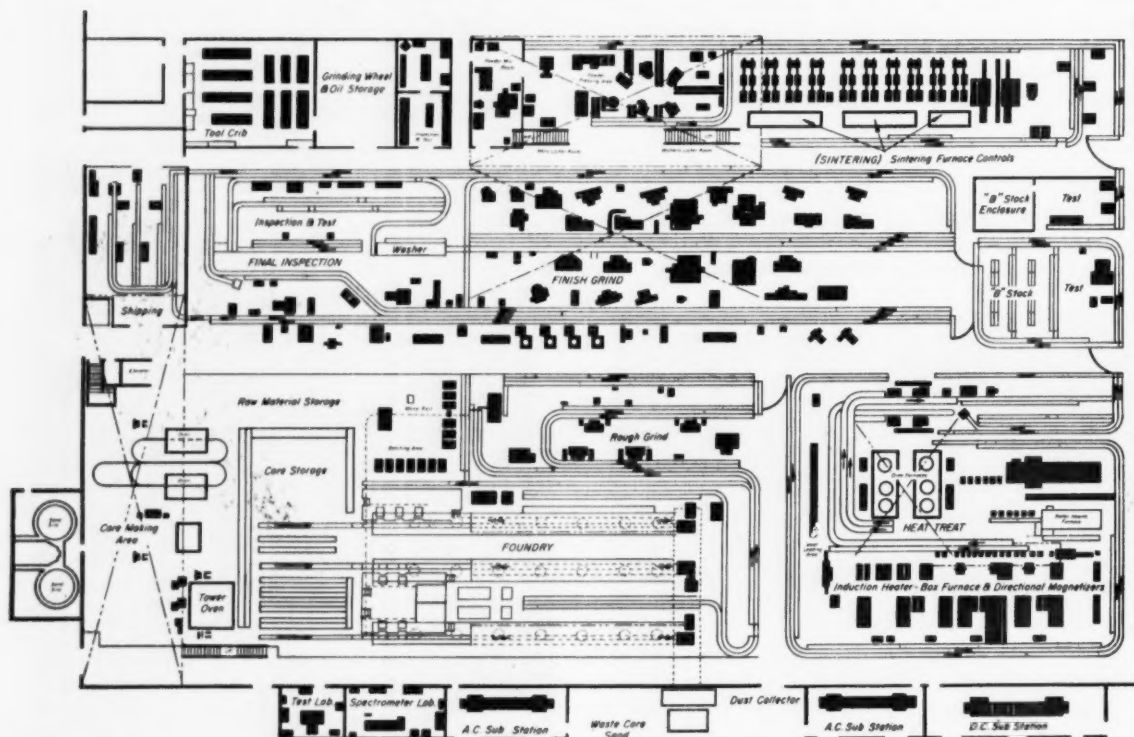
Foundry and machine operations, quality control, packaging and shipping are all integrated into one big process in a new General Electric plant—a single building without partitions but fully safe, clean and comfortable.

HOW FOUNDRY AND MACHINING operations can be fully integrated is shown in the new plant of General Electric's Carboly Department, at Edmore, Michigan.

This facility is for the manufacture of Alnico magnets, most of which are produced from castings. Others are made by sintering. The latter method produces tiny magnets and those requiring more closely controlled dimensional or higher physical properties.

Housed in one building—with no permanent partitions interrupting the some 128,000 square feet of manufacturing area (plus 20,000 for warehousing)—the plant includes just about every type of mechanical equipment to handle and process more than 2,200 different shapes and grades of permanent magnets. Material handling devices include roller, belt, and vibrator conveyors; bucket elevators; chutes, various containers and tote trays; hoists, monorails; and fork trucks.

● PLANT LAYOUT designed for unbroken continuity of production.



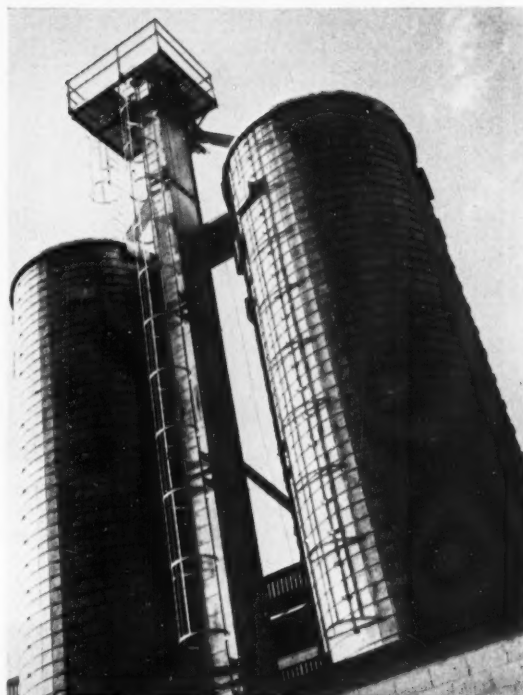
Even though a good portion of the plant is a foundry casting operation, employees work under excellent conditions. Dirt, sand dust, smoke and other foundry residue are exhausted and filtered from the structure by a system of air ducts and hoods. These remove over a million cubic feet of air every four minutes. To avoid a severe pressure drop—that might endanger the structure—and to provide employees with plenty of fresh air, the system also brings in 106,000 cubic feet of make-up air per minute from the outside to balance out the air with that coming through windows and doors.

Silos Store Sand

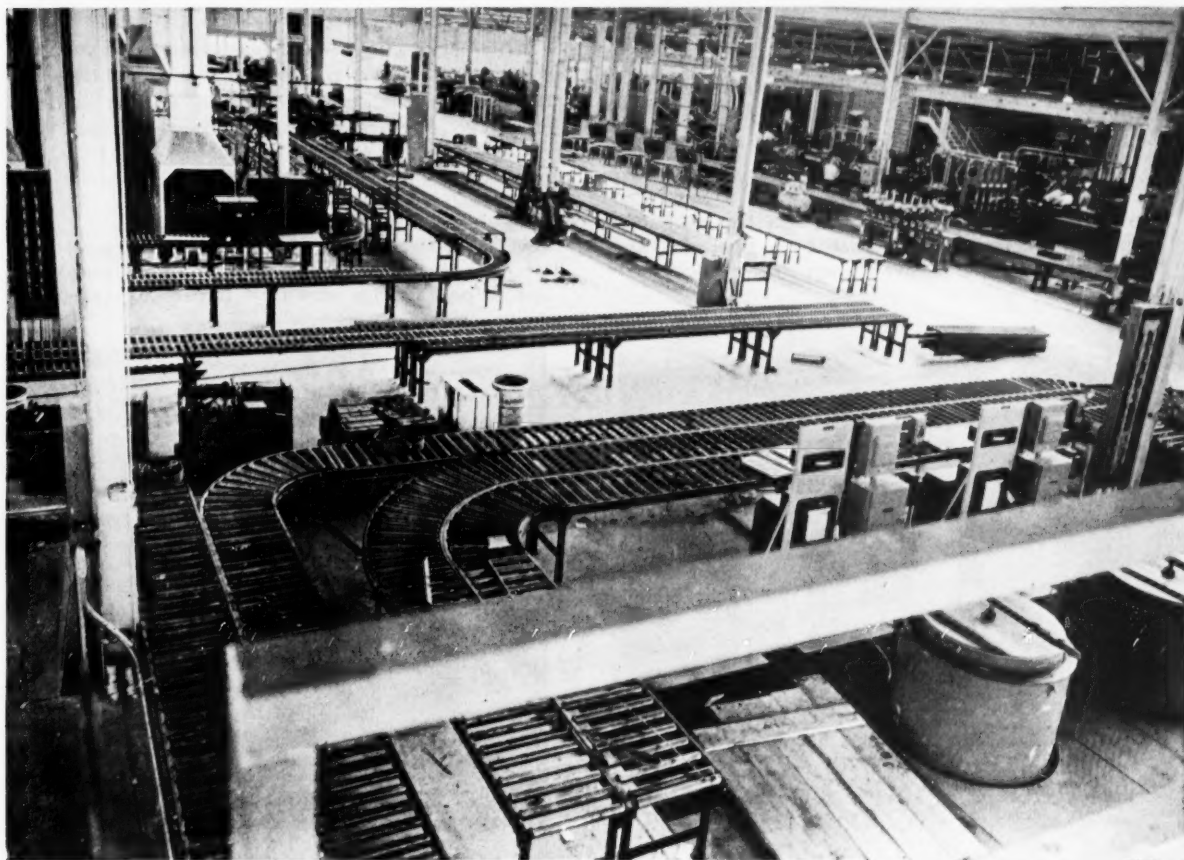
At the start of the process are twin 12x52 ft. concrete silos with a total capacity of almost 500 tons of dry sand. Of this, about 30 tons is available at any time from "live" sand shelves in the top portion of a silo. The balance is held in reserve at the bottom. Sand is delivered by truck, in 10 ton lots, to a hopper at the base of the silos, vibrated to the main bucket elevator between them, then carried to the live storage area. Once the live sand spaces are filled, remaining sand falls by gravity into the lower silo sections. A chute leading from here to the vibrating conveyor makes it possible to transport sand again to the bucket elevator when necessary.

From the live storage, sand is dropped by chute to a

(More on next page)

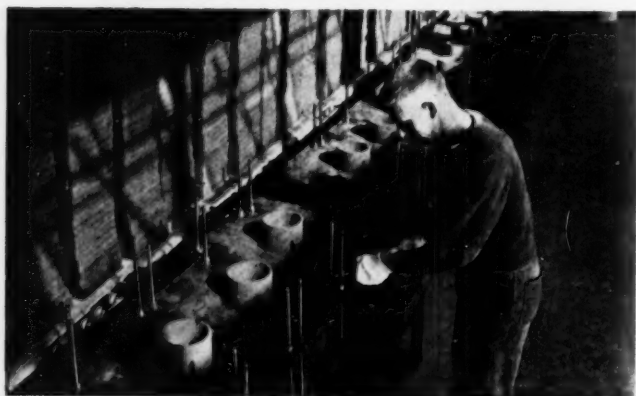


TWIN SILOS, each of 250 tons capacity, loaded by bucket elevator between, deliver 30 tons "live" sand by "push button". Remainder is in "dead" storage.

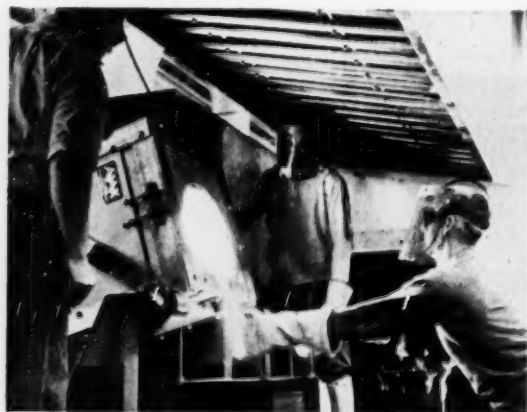




ABOVE: Down-view shows part of grate and angled chute which carries "dead" storage sand from silo to vibrating conveyor at silo base, then to bucket elevator.



ABOVE: After sand leaves silos and is mulled, it is formed into cores which are baked and stacked 10-high on this conveyor for "live storage" and work.



ABOVE: Ready for pouring, stacked cores travel on conveyor to electric furnace. After pouring, castings are rolled into tunnel-like hood for cooling.

Continuous Flow . . . Continued . . .

weighing hopper on the mulling mezzanine floor. There, the operator weighs out 300 pounds and dumps it directly into a wheelbarrow type mulling machine. After mulling, the mold mix is dropped through the mezzanine floor and into hoppers leading to the San-blow core making machines.

Gravity roller conveyors take over the handling job once the cores are processed through the mechanized vertical and horizontal core baking ovens. Conveyors serve both as core storage areas and work benches upon which cores are stacked 10 high. There is sufficient storage capacity for several days' production.

Fork Trucks for Raw Materials

Meanwhile, fork trucks are used to carry raw materials—such as iron, nickel, cobalt and aluminum—from the service building to the batching area. Once the individual heats are weighed, in special tote boxes, electric hoists take over the job—lifting and carrying them via monorail to the melting platform. The metals are shoveled into the furnace, and the melt down begins. The hoists again take over as individual heats are ready—tilting the 300 pound electric furnaces to pour the molten metal into the stacked cores as the latter are conveyed into position near the platform.

After pouring, the flaming cores are pushed down a 96 foot roller conveyor, covered by an exhaust hood, to the shakeout table. There is one of these at the end of each pouring conveyor. As sand falls loose from the

BELOW: After rough grinding, magnets travel on mechanized rollers through heat treating furnace. Special pallet brings work from furnace to magnetizing solenoids.





ABOVE: Circular baskets which carry castings after heat treatment and aging. RIGHT: Baskets have been stacked and placed in drum-type container which is positioned by hoist in aging furnace set below floor.



castings along the conveyor and through the shakeout grating, it drops into an under-floor vibrating conveyor. This leads to a belt conveyor that takes the sand underground, outside the building, and to a 43 foot high bucket elevator that lifts it into a 30 ton waste-sand storage bin.

Roller conveyors take the cast magnets through sand blasting and cleaning sections, while scrap runners and sprues are moved back to the batching area for remelting. A series of lifts and conveyors then continues the handling through heat treating, aging, finish grinding, inspection and testing, packaging and shipping.

Tote trays used in carrying parts through the process measure 12x24x5 inches high. Most of the conveyor system has 12 inch long, 2 inch diameter rollers to accommodate these trays. In the casting section, however, 18 inch rolls are used to handle core stacking plates, while 24 inch rolls handle aging baskets in the heat treating area.

Vibrating Conveyors in V Hoppers

The vibrating conveyors under each of the three melting lines are each 64 feet long and 8 inches wide, forming the bottoms of V-shaped hoppers which confine sand en route to the belt conveyor. This is 14 inches wide, 60 feet long, with a capacity to feed the 30 ton waste sand bin at a rate of 15 tons per hour.

In the grinding areas, where magnets are finished to dimensions—as well as in the sintering, heat treating, and inspection areas—conveyors are arranged so that they not only expedite the flow of magnets to and away from the operators but also serve as work benches.

After inspection and test, magnets are usually demagnetized, then moved by conveyor to the packing and shipping area for counting, packing and labeling.

RIGHT: Weigh counting and packing operations continue on roller conveyor lines from inspection department. Cartons are strapped, assembled into unit loads.



ABOVE: For quality control, test equipment is mounted on conveyor frame. Foot controls speed sequence.



- Careful Scheduling of Yard Bulk
- Handling Operations Provides . . .

HIGH EFFICIENCY *with Minimum* *Capital Investment*



DIESEL-POWERED SHOVEL, left, with 18½-foot boom and 2½-yard bucket, loads truck with slag from railroad siding where it has been dumped from thimbles. As truck is loaded, bulldozer (top) pushes scattered material out of roadway and into position for easy handling by shovel.

MAGNETIC SEPARATOR removes tramp iron from slag after it has gone through crusher (top). • CONVEYOR carries tramp iron into pile in slag yard (middle). • CRANE, mounted on pneumatic tires for maneuverability, is used to pile slag in yard, to load customers' trucks and to service concrete batch mixer in yard (bottom). Crane has $1\frac{1}{2}$ yd. bucket and 60-ft. boom for long reach, wide swing.



A DIESEL-POWERED SHOVEL with torque converter, three drop-bottom trucks, a series of belt conveyors, and three cranes handle approximately 1,000 tons a day in the processing of slag at the yard of a Cleveland steel manufacturer.

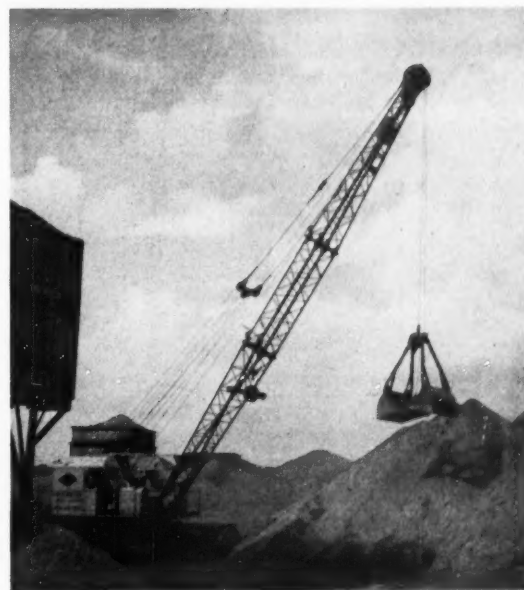
The company crushes and screens slag into seven sizes. Most of it is loaded into railroad cars and customers' trucks, but some goes into a batch mixer for concrete—with the customers supplying the cement and sand and the steel company the slag. The firm feels that careful scheduling for flow as continuous as practical has allowed a minimum investment in equipment.

Hot slag is dumped along a railroad siding a mile and a half from the yard. It is dug out of the bank by the shovel, which has an $18\frac{1}{2}$ -foot boom and $2\frac{1}{2}$ yard bucket. With the diesel-torque-converter power unit, the equipment, in ripping out the material, can come to a dead stall, be pulled out, and be given another thrust—thus it “worries” the chunks of slag until they fall into the bucket. Two men take care of this operation. Another man runs a bulldozer which not only clears the way for trucks but also pushes scattered material into position for easy handling by the shovel.

The trucks which carry “raw” slag to the yard are also diesel powered. Their sides are vertical, and two doors running lengthwise of the bottom are air-operated by a lever in the cab.

Loaded trucks climb a steep roadway, cross one of Cleveland's main thoroughfares, and travel to the crusher in the yard. The gravity-fed crusher is at the bottom of a hopper, the top of which is slightly above ground level. When trucks are driven to the top of this hopper, one movement of the pneumatic control dumps the contents into the crusher. This takes only a few seconds, and the truck is again on its way. Travel between the siding and the yard has been

(Continued on page 92)



Improved operating efficiency and employee relations result when . . .



ROLL-HANDLING attachment on straddle-type fork truck and storage racks are both equipped with roller conveyor so operator can easily push heavy carpet into storage position.

MACY'S, New York, "the world's largest department store", recently completed a long shake-down on an extensive material handling modernization program at their twenty-five-year-old, 1,030,000 square foot, multi-story warehouse on Long Island.

The program, now in successful operation for over a year, proves once again the wisdom of using sound engineering and industrial principles to get desired warehousing and service results. The scientifically engineered layout for storage and handling of materials has paid off handsomely with a streamlined flow of merchandise, better service to customers, improved working conditions and efficiency. A feeling of achievement is shared by employees at all levels along with management, for all helped in a truly "joint venture".

PROGRESSIVELY smaller racks save space. Full rolls are kept in bottom section; as cuts are made rolls are moved to higher positions. Dollies handle lower rolls.



Macy's Overhauls Handling

Highlights of a modernization program—in a multi-story, million foot storage plant—which has paid off in a streamlined flow of material, high employee morale, and a substantially increased efficiency.

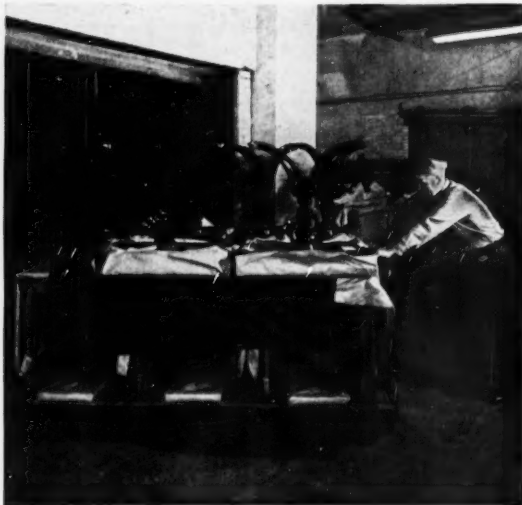
Macy's warehouse operation covers a variety of merchandise classifications and services. Receiving, storage, delivery, furniture and carpet workrooms, wrapping and packing are only part of the many activities carried on in this giant center. A brief review of statistics will indicate the magnitude of this operation.

The warehouse receives the equivalent of 1,200 carloads of merchandise during the busy Fall season. This represents about 48,000 tons of goods to be handled over the rail and truck platforms.

The furniture delivery fleet varies from 50 to 130 truckloads per day as dictated by seasonal volume.

The bulk volume of merchandise handled in a year is about 200,000 units (manufacturer's pack).

LARGE LOW-BED TRUCKS handle quantities of many kinds of furniture. These units are four feet wide, eight long, and the huge elevator can carry six at a time.



FAST PACKING and shipping operation is built around 300 ft. belt conveyor which runs past packing benches, to sorting conveyor for delivery to carriers.

Full advantage has been taken of the unit load principle, and some 12,000 pallets are in use. They are of the four-way, single face wing type, measuring 34 x 40 inches. This type was selected as best satisfying a condition where there is a constant interchange between mechanized stacking equipment and hand jacks.

Industrial material handling methods were applied to improve this complex warehouse operation. The Macy warehouse management, working closely with the industrial engineers, obtained factual answers and practical solutions to warehouse problems. The high points of the warehouse modernization and improvement program are outlined below. Specific examples are shown in the photographs.

Receiving

Receiving operations are standardized to four definite methods, depending on the character of the merchandise. Inbound cased merchandise is handled on pallets via pallet jack and fork trucks that stack in six-foot aisles. Furniture is loaded on 4x8 foot low bed wheelers and taken via elevator to the furniture storage racks. Inbound rolls of carpet are transported on specially designed roller conveyor trucks that move 800 lb. rolls, with a minimum of handling, from truck dock into conveyORIZED storage racks.

Import crates of china and hogsheads of glassware are handled on the larger 3x5 foot wooden skids. China and glass are largely stocked in bins as palletized storage is not a prime requirement. A pallet jack with a hinged skid adapter frame is used to handle both pallets and skids.

The receipt of palletized and strapped unit loads, through cooperation of the manufacturers' has resulted in a smoother receiving and storage operation. Many small products formerly handled piece by piece are now unit loaded.

Storage

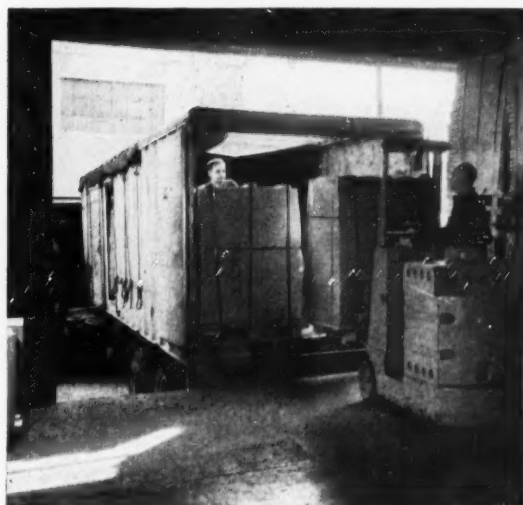
Warehouse storage methods have been specified for each particular merchandise item. They break down into the following broad groups: palletized storage, pallet racks, special furniture racks, china bins, and general purpose racks and bins.

(Continued on page 120)



UNIT HANDLING stressed in new system. Here, pallet load is assembled in receiving dept. Pallet truck has hinged adapter frame to handle skids when desired.

SUPPLIERS' COOPERATION in shipping unit loads, such as these palletized and strapped boxes of soap chips, has aided in achieving new handling efficiency.



PRESIDENT



Charles B. Elledge
General Electric Co.

MHI Elects New Officers for 1954

THE Material Handling Institute met in New York on December 15 and elected its officers for 1954. The new president is Charles B. Elledge, manager of material handling industries sales, General Electric Co. He succeeds Howard M. Palmer of Lewis Shepard Products, Inc., 1953 president who will now become a director of the association.

To help Elledge administer the educational work and services of the Institute to industry, Walter E. Schirmer, vice president, Clark Equipment Co., and Edward W. McCaul, secretary, Jervis B. Webb Co., were elected first and second vice presidents.

Eight new directors also elected at the meeting are: Roland Whitehurst, Electric Storage Battery Co., Electric Accessories Section; W. G. Reycroft, Bassick Co., Wheels & Casters Section; D. H. Bitney, Union Steel Products Co., Container & Rack Section; R. L. Fairbank, Towmotor Corp., Industrial Gasoline Truck Section; C. O. Hedner, Yale & Towne Mfg. Co., Electric Hoist Section; Wayne O. Stoughton, Pittsburgh Steel Prod. Co., Pallet Section; John W. Stiles, Island Equip. Co. Conveyor Section; George W. Raymond, Jr., Raymond Corp., Hand Lift Truck Section.

Other directors, whose terms do not expire this year are: Wilbur Mayer, Loudon Machinery Co., Monorail Section; W. B. Renois, Gerrard Steel Strapping Div., U. S. Steel Corp., Steel Strapping Section; S. K. Towson, Elwell-Parker Electric Co., Electric Industrial Truck Section; M. G. Peck, Clark Equip. Co., Powerized Hand Truck Section.

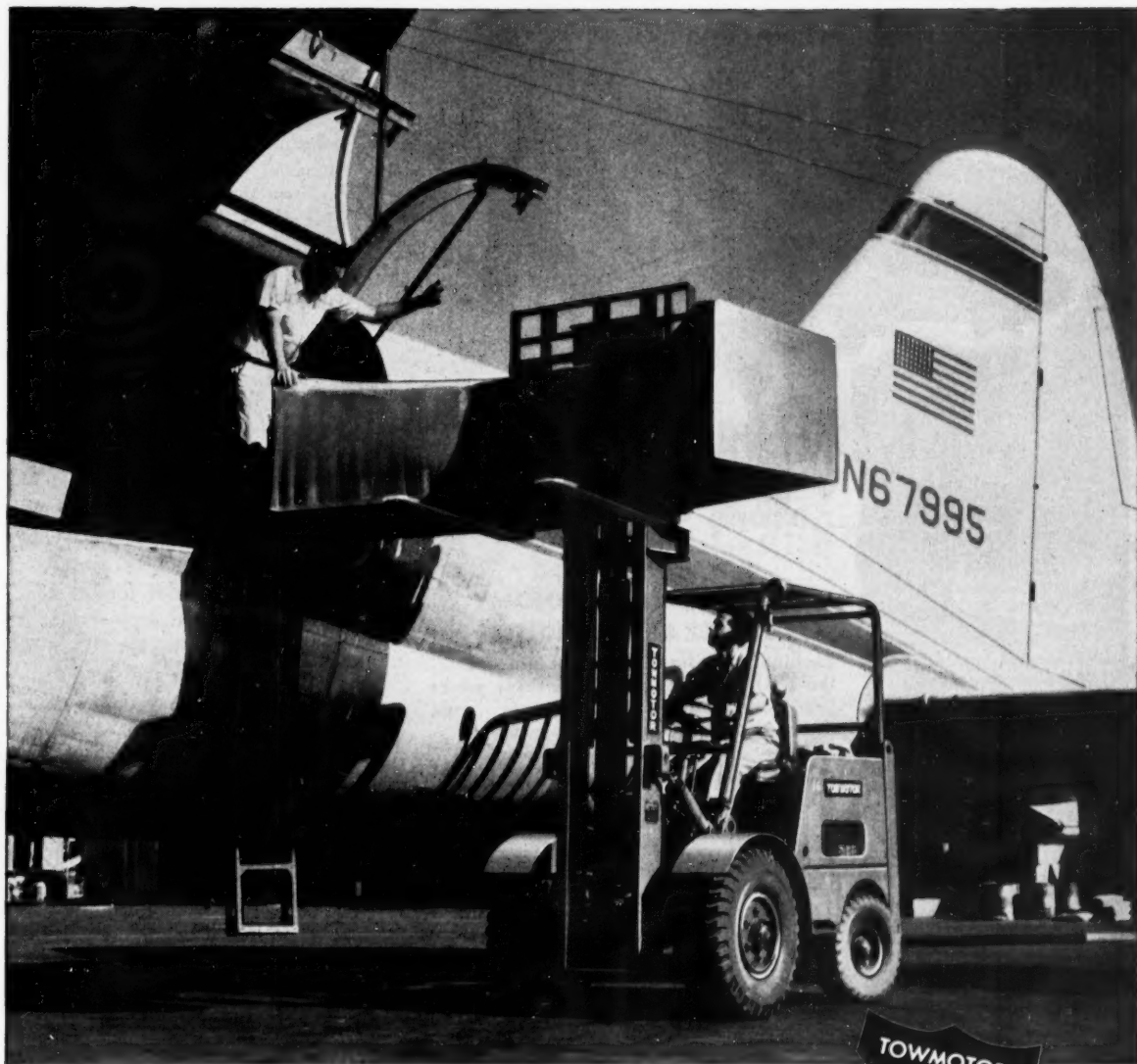
VICE PRESIDENTS



Walter E. Schirmer
Clark Equipment Co.



Edward W. McCaul
Jervis B. Webb. Co.



Modern transportation demands the ultimate in materials handling. This Towmotor LT-60 is one of a fleet owned by Flying Tiger Line.

Get up and go...

Towmotor has the "get up and go" you want to speed materials through each step of receiving, storage and production, right into the carriers—even when you're short-handed! This "one-man-gang" lifts, carries, lowers and positions any load that can be handled.

If you like to break records, if your boss is economy-minded, you'll want all the new Towmotor features, including Towmotor Towmo-Torque Drive, Power Steering, and "Cushioned Power" Diesels. Send for free booklet, "What Makes It Tick?" TOWMOTOR CORPORATION, Div. 801, 1226 East 152nd Street, Cleveland 10, Ohio.

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THE Buschman



Trojan

FOR GREATER ECONOMY IN PACKAGE HANDLING

Loading, unloading, stacking or boosting . . . the TROJAN powered belt conveyor moves bags, boxes, cartons, cases and crates . . . up, down or on the level at 50 feet per minute . . . in forward or reverse belt direction.

Durable and dependable, this materials handling helper is a most versatile unit. Three sizes feature the "safety balanced boom" which provides for instant adjustment of working height . . . removable boom section for use anywhere . . . positive belt tracking . . . special "rough top" belt that guarantees multiple grip on packages and facilitates conveyor use at angles up to 45 degrees . . . easy rolling rubber-tired wheels and positive floor locks . . . ball bearing roller bed . . . sturdy undercarriage . . . and operation from any standard electrical outlet.

One man can position the TROJAN. One man can operate the TROJAN. For fast, safe, low-cost and efficient package handling . . . **YOUR BEST BUY IS THE BUSCHMAN TROJAN!**

PERMITS RAPID,
EFFICIENT LOADING
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SIMPLIFIES PACKAGE
HANDLING
BETWEEN FLOORS

SPECIFICATIONS:

DESCRIPTION (12" Belt Width)	TROJAN 10		TROJAN 15		TROJAN 19	
Power Feeder Section	23" Long	100 lbs.	23" Long	100 lbs.	23" Long	100 lbs.
Gravity Discharge Section	14" Long	24 lbs.	14" Long	24 lbs.	14" Long	24 lbs.
Undercarriage Unit	2'-9" Wide	230 lbs.	2'-9" Wide	230 lbs.	2'-9" Wide	240 lbs.
Boom Section	1'-6" Wide	320 lbs.	1'-6" Wide	380 lbs.	1'-6" Wide	460 lbs.
Length of Boom	10'-0"		15'-0"		18'-10"	
Weight (Boom, Chassis & Motor)	603 lbs.		712 lbs.		802 lbs.	
Roller Spacing in Boom Section	8" Centers		8 3/4" Centers		8" Centers	
Unit Load Capacity	175 lbs.		200 lbs.		200 lbs.	
Total Load Capacity	400 lbs.		500 lbs.		500 lbs.	

C-1671-EWB

PRODUCE MORE . . . FOR LESS

or
Buschman
Conveyors

WRITE TODAY FOR
YOUR COPY OF
BULLETIN NO. 50A.



Representatives in Principal Cities

THE E. W. BUSCHMAN CO.

4450 CLIFTON AVE., CINCINNATI 32, OHIO

Canadian Licensee: J. A. McKechnie, Ltd., Toronto 13, Ontario

Circle No. 66 on Reader Service Card for more information

HIGH EFFICIENCY . . .

(Continued from page 37)

scheduled so that there is a minimum of waiting at the shovel.

From the crusher, slag is carried by a 30-inch transfer belt approximately 170 feet, up an incline, to a magnetic separator, which takes out the tramp iron. Approximately 5,000 tons of iron a year are thus recovered for re-melting.

From the separator, slag is carried by belt approximately 270 feet to two sets of three-decker screens, each 14 feet long and 24 feet wide. Leaving the screens, most of the slag falls into bins, each taking one of six sizes.

As slag is needed for the concrete batch mixer, a portion of it is diverted to a bucket conveyor, which takes it to the top of another crusher house where it is ground to a size to meet the requirements of the mixer.

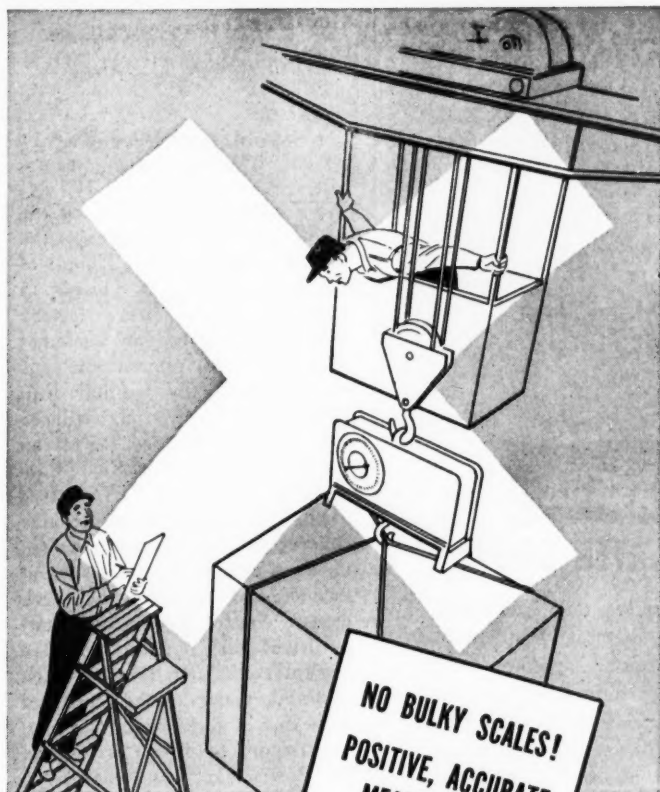
Rail cars and trucks are loaded from bins, until the bins are empty; then the customers' trucks are loaded by crane from piles in the yard. Cars are weighed by the railroad company after they are pulled out of the yard. Customers' truck loads are weighed at the slag yard, and the weight records used for billing.

Bins are filled, to a total capacity of 150 tons, in the afternoon when the traffic slows down. After bins are loaded, the yard trucks haul the overflow to piles, of which there are six, each storing a different size slag.

Three cranes are used for loading outgoing trucks. Two of them, one with a half yard, the other with a one yard capacity, are crawler mounted. The third, a 1 1/2-yard crane with 60-foot boom, is mounted on pneumatic tires for fast maneuverability. It allows trucks to be filled with minimum delay from piles in any part of the yard, which covers 2 acres.

Moving from pile to pile, each crane may load from as many as 4 or 5 piles during one eight-hour day.

FLOW • JANUARY, 1954



Weigh faster ... more accurately ... with a **BALDWIN SR-4[®]** crane scale

Overhead weighing need no longer be cumbersome, time consuming, dangerous or inaccurate. By replacing ordinary weighing devices with a Baldwin SR-4 crane load-weighting unit, you can have all the advantages of electrical weighing—the speed—the conveniences—the high accuracy—the freedom from hazards.

A simple unit, this new electrical weighing device consists of the SR-4 pick-up, the instrument, and cable reel if required.

The portable crane scale is simply hung on your crane hook—the Baldwin SR-4 Load Cell is hermetically sealed, temperature compensated and free from moving parts. This load cell offers a reliable, rugged, accurate system, hard to obtain with other weighing methods.

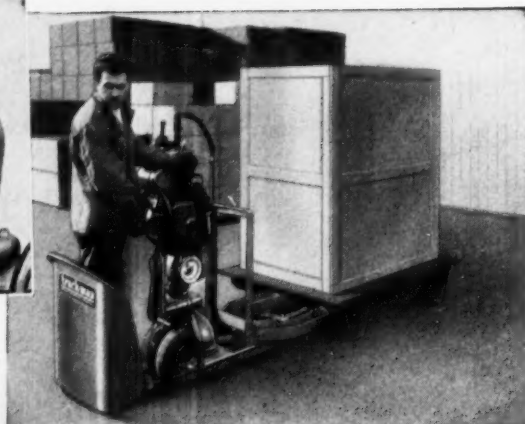
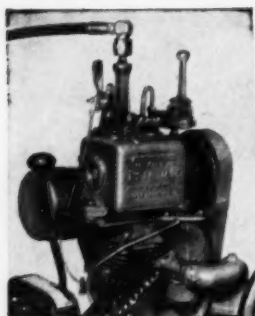
The electrical signal can be transmitted to indicators, recorders, or printers located either in the crane cab or at any other convenient spot in the plant. Readings are easily made—without danger to employees—without the usual inaccuracies and lost time. Baldwin SR-4 Crane Scales have Standard Capacities of 5, 12½ and 25 tons. Other capacities are available on special order.

For further information write for our new bulletin on crane scales. Address Dept. No. 3111, Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pennsylvania.



BALDWIN-LIMA-HAMILTON

Philadelphia 42, Pa. • Offices in Principal Cities • In Canada: Penrock Bros., Ltd., Montreal, Quebec
Circle No. 18 on Reader Service Card for more information



NOW truck-man

WITH POWER LIFT FOR GREATER SAVINGS

Successfully tested in the heaviest industries, two Truck-Man models are now ready to cut your costs still more with power lift. Hundreds of Truck-Man trucks with much smaller load capacities and only hand pumps are more than earning their way throughout the nation. Now Power Lift increases this efficiency while retaining the advantages of the agile standard models. A flick of the wrist and the new power lift raises or lowers the load instantly. Once load is raised from the floor, truck can start as balance of lift can be made in transit. 15-40 seconds are saved each trip — more trips per day — more work with less effort.

SIX VERSATILE MODELS

NEW MODEL DHP — Heavy Duty Skid Lift with power pump, 4500 lb. capacity — scoots through narrow aisles, up inclines and around sharp corners with a full load, three shifts a day with ease.

NEW MODEL DFP — 3000 lb. capacity, power lift Pallet Toter — hustles those heavy palletized loads around the plant in jig time. Easily does the work of units costing 3 to 5 times as much.

MODEL DH — 4500 lb. Skid Lift with Hand Pump. **MODEL DF** — 3000 lb. Pallet Toter with Hand Pump. **MODEL DT** — 2000 lb. Platform Utility for intra-plant messenger service, parcel delivery or other manually handled loads. **MODEL DR** — Truc-Tor for towing those heavy cargo trains — up to 6500 lbs. on dry level concrete.

Clip and Mail This Coupon For Further Information

truck-man
Div. of the Knickerbocker Co.
582 Liberty Street • Jackson, Michigan

Please send catalog and further information on:

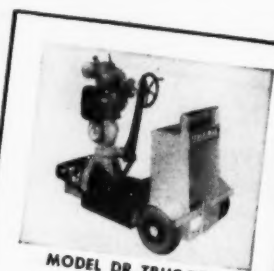
<input type="checkbox"/> Model DHP	<input type="checkbox"/> Model DFP	<input type="checkbox"/> Model DH	<input type="checkbox"/> Model DF	<input type="checkbox"/> Model DT	<input type="checkbox"/> Model DR
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NAME _____

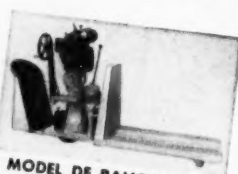
TITLE _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____



MODEL DR TRUC-TOR



MODEL DF PALLET TOTER

TRUCK-MAN OWNERS

Convert your present Truck-Man Trucks with the Packaged Power Lift Conversion Unit.

New larger diameter lift cylinder and all other parts required by change are included. Easily and quickly installed.

HIGHLIGHTS . . .

(Continued from page 34)

School for Preventive Maintenance

Watch for word about the arrival in your area of the new touring Service School of Clark Equipment Co. This is an extension of the firm's factory training program for customer personnel. It is offered for your employees already familiar with general automotive maintenance and repair techniques, says Ivan E. Howard, Clark Service Manager.

Subject matter in the course concentrates upon recent developments in equipment, such as maintenance and operation of Clark electric control systems and power drives—the Dynatork and the Hydratork. Also covered are the hydraulic system on the Clark and Ross line of fork trucks and towing tractors, the Ross Carrier, and the Powrworker hand-stacker.

Two sessions are held each day, one in the afternoon, the other in the evening. Class sessions are limited to 60 students. School equipment, transported in a special over-the-road tractor-trailer includes working cutaway models of assemblies, movies, slides, printed study material, and a public address system. The trailer is accompanied by the instructor and an assistant.

Safest Woodworking Plant

It would have been nice if the word about this had arrived before the December, **Safety Issue** of FLOW went to press. American Box Co., Cleveland, has won a fourth consecutive title as "The Safest Woodworking Plant in Ohio."

The firm has had a perfect no-accident record for four straight years. This in spite of extra hazards created by production increases during that period, according to Henry S. Kubes, Vice President and Manufacturing Manager. On the safety team with him are Glenn E. Maxfield, Plant Superintendent, and George Lukacs, Safety Director.

Circle No. 140 on Reader Service Card for more information

AD LITERATURE . . .

(Continued from page 63)

Two bulletins are available from Silent Hoist & Crane Co. Bulletin No. 75 give complete details on the Lift-O-Krane while bulletin No. 77 covers the company's Liftruk line.

Circle 153 on Reader Service Card

Descriptive literature on the Robo-Lift Bucket Elevating Conveyor and the Robo-Lift Tray Elevating Conveyor may be requested from the Counsel Machine Co. Inc.

Circle 39 on Reader Service Card

Full information may be obtained from the Revolver Co. on its portable Uplifter elevator. It is said to be both easy and inexpensive to operate. Two available models have capacities of 1000 and 2000 pounds.

Circle 124 on Reader Service Card

Answers to almost any shipping or packing problem may be obtained from Acme Steel Co. whose engineers always are ready to serve industry with their years of experience. Complete literature is available.

Circle 14 on Reader Service Card

Literature concerning its free layout and engineering services may be obtained from Easiquip Co. The company's system provides a sound solution to satisfactory warehousing of roll goods, especially where portions of the rolls must be removed periodically from inventory.

Circle 54 on Reader Service Card

Information telling how you can stop profit leaks by cutting handling costs on your loading dock is contained in literature available from Karl A. Herman Co.

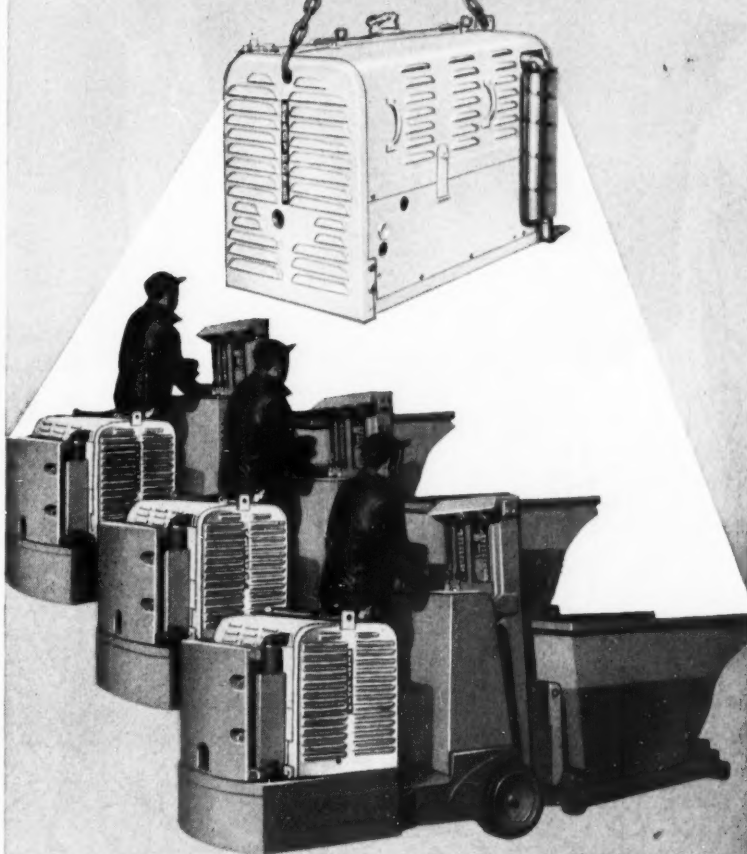
Circle 69 on Reader Service Card

How to provide easy mobility to a variety of industry products is explained in literature available from Ironbound Box & Lumber Co. The firm manufactures a wide line of floor trucks, dollies and skids.

Circle 154 on Reader Service Card

PREVENTIVE MAINTENANCE

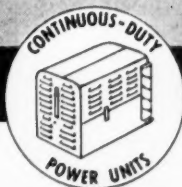
eliminates truck downtime



READY-POWER is BEST FOR PREVENTIVE MAINTENANCE

Tie up a truck because of power failure? Never! Equip your fleet with *interchangeable* Ready-Power gas-electric units and, then, have one extra for the shop. Thus, power units can be rotated for preventive maintenance . . . and your trucks stay on the job . . . where they belong.

Remember...Your Truck Is No Better Than Its Power!



The READY-POWER Co.

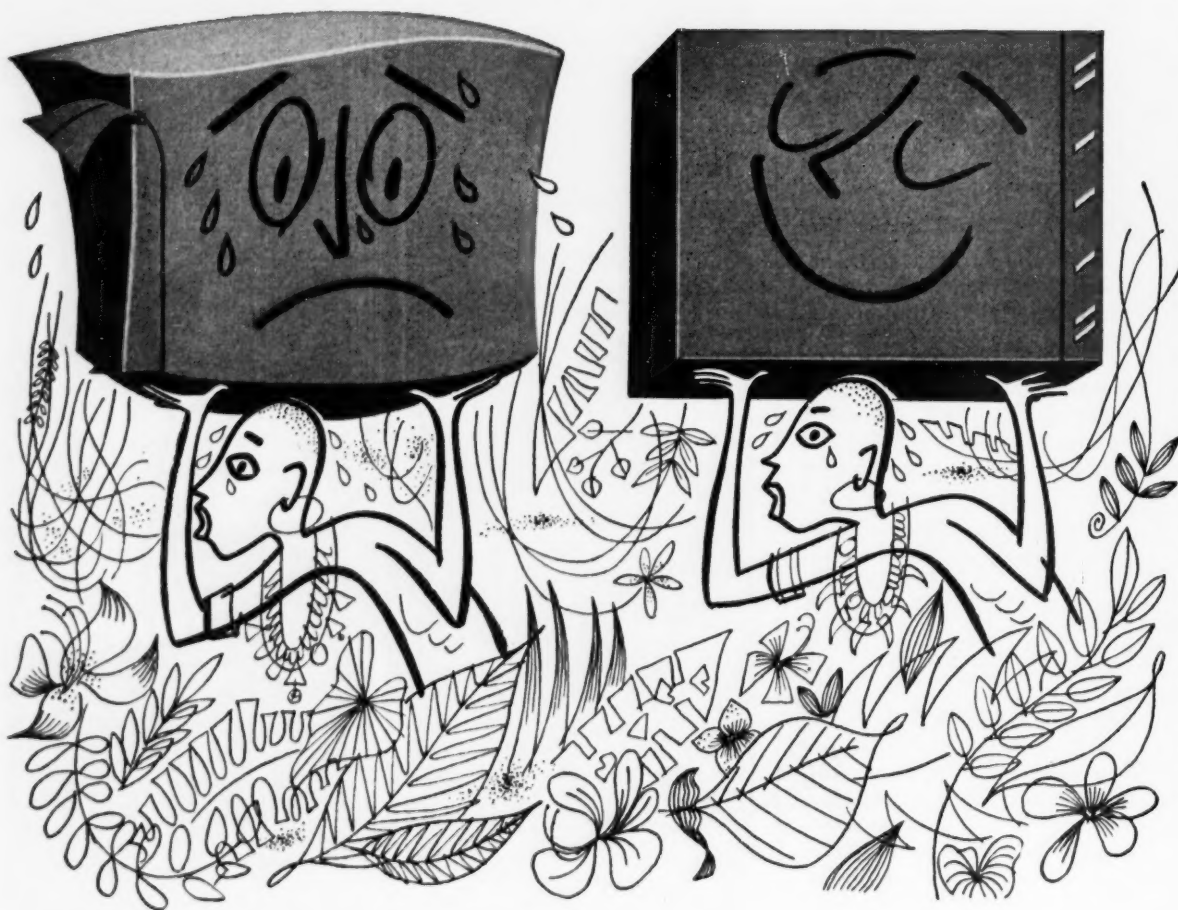
3838 Grand River Ave., Detroit 8, Michigan

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

Circle No. 156 on Reader Service Card for more information

This humidity is
killing me

not me,
I have a Bostitch
stitched seam



When you entrust your goods to a completely stapled carton, humidity is just one of the shipping hazards you no longer have to worry about.

Carton joints prestitched on corner seams and top and bottom flaps sealed with staples are also immune to extremes of heat and cold, fog, mist—even rain and melting ice!

Two thicknesses of board stitched together are twice as strong as two facing liners glued together . . . four times stronger than a single thickness of tape. A completely stapled carton carries heavy loads more safely and discourages pilferers.

Next time you order cartons, make sure they have Bostitch stitched seams. Then why not ask your nearest Bostitch Economy Man to stop by and check your carton top-and-bottom sealing operations? He may be able to save you a great deal of time and money.

Look for "Bostitch" in your phone book, or write to Bostitch, 701 Mechanic St., Westerly, R. I.

Fasten it better and faster with



Circle No. 22 on Reader Service Card for more information

PACKAGING and SHIPPING SECTION

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DEVOTED TO THE MECHANICS OF PACKAGING AND
PREPARATION FOR SHIPPING . . . MATERIAL HANDLING FUNCTIONS

An Easy Index to This Month's Advertisers

Are you looking for a particular type of packaging and shipping equipment? Listed below are advertisers according to type of product they are advertising in this issue. We have attempted to make your job a little easier by listing them as often as possible. To use this index, find the type

of product in which you are interested . . . turn to the advertisers listed under that product . . . circle the correct numbers on the reader service card, mail it in, and you'll get complete information in a jiffy.

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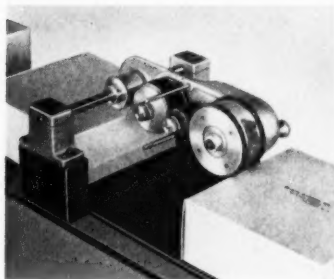
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WHAT'S NEW... in Packaging and Shipping Equipment



Redesigned Marking Machine

A complete redesign of the Gottscho Rolacoder 401 production-line imprinting machine has been announced by Adolph Gottscho, Inc. Chief among the cited improvements is a "float-action" inking system that assures consistently uniform markings throughout a run without requiring any adjustments. Another new feature of the machine is a friction bearer that is said to have long life.

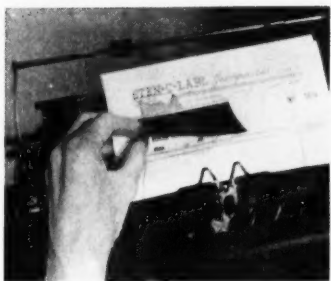
Circle No. 202 on Reader Service Card for more information



Liquid-Holding Box

A new container, capable of holding liquids for weeks without any apparent seepage has been announced by Hinde & Dauche Paper Co. Constructed of one-piece, die-cut corrugated board, it can be supplied with the inside glassine-laminated, covered with a special coating, or a combination of both. Named the Never-Leak box, it is suggested for use in shipment of moist products like meats, sea foods, lard, vegetables, powdered and granulated products.

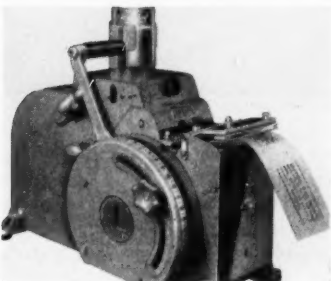
Circle No. 203 on Reader Service Card for more information



Simple, High Speed Addressing

A time and labor saving method of addressing multiple shipping labels, tags and cartons has been announced by Sten-C-Labl, Inc. Basis of the marking system is the Sten-C-Labl, a sheet of stencil paper which can be tabbed over the name and address section of an invoice or bill of lading to permit cutting the stencil at the same time the record form is filled out. The stencil is then affixed to an inked rubber hand stamp and as many labels or tags as needed can be imprinted at high speed.

Circle No. 204 on Reader Service Card for more information



Tape Dispenser-Coder

The CodeTaper #120 of Better Packages, Inc., imprints selected information right on sealing tape during the exact interval when tape is being discharged by the dispenser. Pertinent information can be incorporated right on the tape as an aid in identifying contents, packers, inspectors-production, packing and perishable dates. Simple to maintain, the machine uses easy-to-change rubber type, and anyone can insert or remove type easily, whenever necessary.

Circle No. 205 on Reader Service Card for more information

(Continued on page 118)

A NEW IDEA FOR . . .

Efficiency in

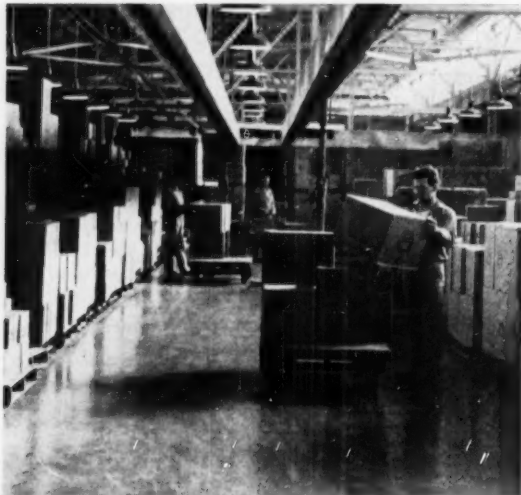


ORDER SERVICING . . .

HAND DUPLICATOR STENCILS are attached over address area (insert). When order comes in, typist cuts stencil and addresses bill of lading, etc., at one time. Dye in stencil registers on space beneath it . . . Carbon sheets between other forms also transfer data.



PNEUMATIC TUBE provides rapid means of communication between order service department and traffic department. In the latter, invoices are sorted and arranged into trailer load groupings. Until in trailer for shipment, orders lose customer identity.



STOCK SELECTION AND MARKING . . .

DRAG LINE SYSTEMS and platform trucks travel through warehouse, following path of sales-frequency of items. Each order picker handles stock selection for one trailer. When platform trucks are full they are permitted to travel to end of line where they are sorted.



STENCIL is detached from invoice after order has been filled, and is affixed to self-inking hand stamp. This completely eliminates any possibility of error in addressing because only one typing was required for all forms. Until this point, they were not separated.

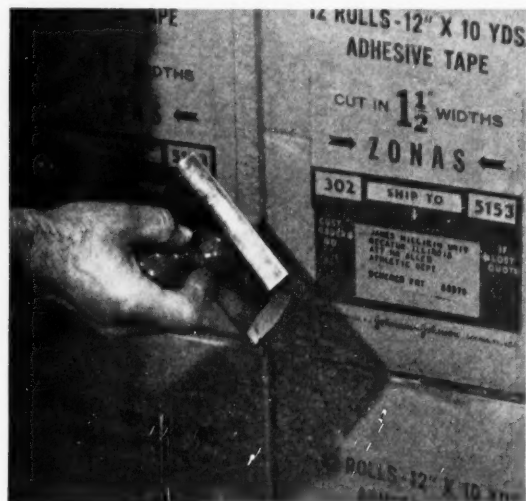
Warehousing and Shipping

Customer satisfaction, a health tonic for any business, is assured at the Chicago warehouse of Johnson & Johnson. Speed and accuracy of order filling have been made all that a buyer of supplies could desire.

Through a closely co-ordinated system of bill of lading and invoice preparation, scheduling, order filling, marking and loading of shipping vehicles, the company has made it a virtual certainty that any order received will be shipped out within 30 hours after it arrives. The system provides enough flexibility in all operations, so that emergency orders can be moved out at considerably greater speeds.

Stencils Tie-in System

Key to the success of the system is a simple duplicator stencil made primarily for use with a hand stamp in the marking of outgoing cases of materials. In J & J's operations however, the stencil's work actually starts when orders first reach the company's order service department.



DIRECT-TO-CASE MARKING is done by checker who also makes certain that each order has been filled correctly. Cases are pre-printed with standard Johnson & Johnson address form. Stamp includes order no., address of customer, J & J's invoice, name of carrier.

Previously, un-cut stencils have been applied with cellulose tape to each invoice. They have been positioned over the area where customer's name and address will be typed on each invoice. During typing, a dye with which the stencil has been impregnated is transferred to the invoice. Therefore, when invoices are made up, stencils are cut simultaneously. Carbon sheets transfer data to bills of lading and other forms, also at the same time that stencils are cut.

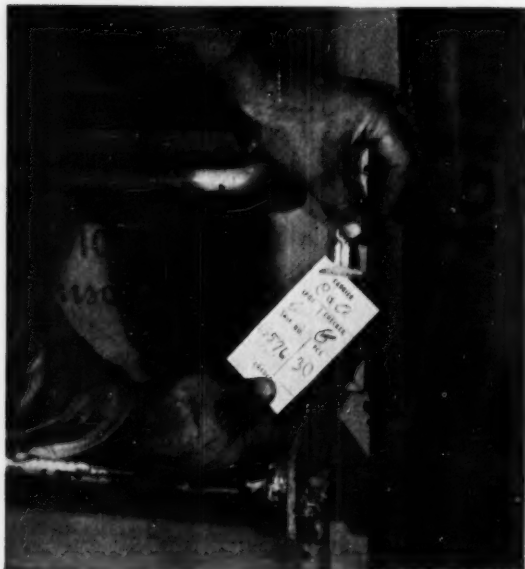
The procedure insures identical information on all printed forms which will pertain to any specific order. A single typing operation ties-in all subsequent operations including traffic planning, stock selection, checking, marking of containers and loading of vehicles.

In Johnson & Johnson's traffic department, shipping schedules are set up. Each customer's order is assigned for shipment via a carrier selected at this time. Invoices, with bills of lading, stencils and all other forms still attached, are sorted and accumulated according to the trucking company which will transport the material specified on each. From this point until the final checking of orders, invoices lose their identities insofar as customer names are concerned. Orders are filled in accordance with shipment schedules prepared by the traffic department, and identity of each order will be by the vehicle which will be used. All operations are scheduled for efficient stock selection and movement of materials to shipping vehicles.

Orders, grouped in this manner, are delivered to a dispatch office where stock selection and shipping activities for each day are planned. The dispatcher is able (because of the groupings of invoices) to call specified trucking companies, tell them that shipments of certain numbers of pieces, to be delivered to such-and-such destinations will be ready for loading at definite times. He also assigns loading spots on the shipping dock for the vehicles which will be loaded during the day.

VEHICLE LOADING . . .

(See next page)



VEHICLE LOADING . . .

LOADING INSTRUCTIONS are written on ticket by checker, then clipped to front end of platform truck. It tells name of carrier, loading dock at which it will be parked, number of pieces on truck, invoice no., and has space for insertion of identity of loader after loading.

After vehicle assignments have been made, the invoices are given to stock selection men called "case stock men". A single case stock man handles an entire assignment (vehicle load), filling one order at a time.

Efficient Layout of Warehouse

A drag line system used in conjunction with four wheel platform trucks follows a pre-determined path through the warehouse. As trucks move along the route of the drag line, case stock men walk along, picking off supplies called for on invoices, and placing them on the trucks.

Layout of the area has been designed on a "sales-frequency" basis. Items which move the fastest are placed near the beginning of the stock selection route, with others following in the order of diminishing sales frequency.

One or more complete orders are often placed on each platform truck. Larger orders may require the use of several trucks. Never is a partially filled order mixed with other completed ones. This eliminates possibility of confusion on the part of the case stock men.

The drag line conveyor and the trucks which operate with it have proven great time savers. Trucks are equipped with a pressure bar suspended in front, near the

(Continued on page 112)



HYDRAULIC ADJUSTABLE DOCKS provide smooth movement into carriers. Loader transfers cases into vehicle, signs ticket shown in previous photo, and places it

in holder beside dock. Comparison of totals on tickets with invoice gives check of contents of vehicle. Note platform trucks at standstill waiting to be unloaded.

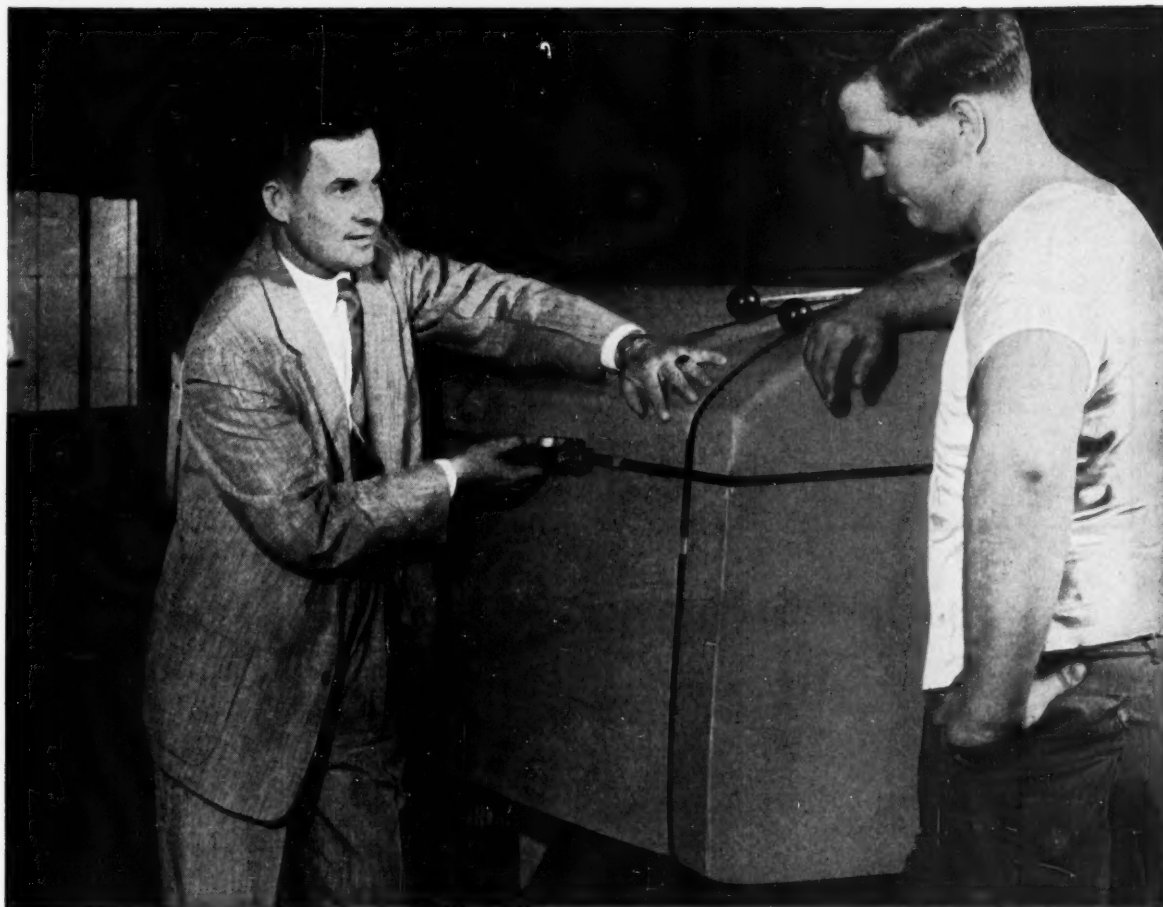


Photo courtesy Clark Grave Vault Co.

Use this complete strapping service!

TRAINED Brainard salesmen can help you develop more efficient systems for packaging, palletizing, carloading, bundling, export crating, and warehousing. For example, here's salesman Jack Worrel of Columbus, giving an *on-the-job demonstration* to a customer shipping heavy steel vaults. Properly applied steel strapping holds the corrugated covering securely in place, protecting the product against damage in transit or in storage.

It's a wise idea to add a Brainard

salesman to *your* materials handling team. He's factory trained in handling and shipping methods. He's equipped to study your operations, make specific recommendations, and demonstrate proper strapping methods to your personnel.

Send coupon now for an analysis of your handling and shipping operations . . . it can lead to improved efficiency and substantial savings.

Brainard offices located throughout the United States. In Canada: Brainard Steel Canadian Division, Toronto.



PORTABLE STRAPPING KIT...new Brainard Utilikit is a completely self-contained strapping outfit. Lightweight, ideal for carrying to a variety of strapping jobs.



Brainard Steel Division, Dept. K-1
Griswold Street, Warren, Ohio

- ☐ Send catalog on Brainard Strapping System
- ☐ Send booklet on new Utilikit
- ☐ Please arrange strapping system analysis of our operations.

Name _____
Position _____
Company _____
Address _____
City _____ State _____

STEEL STRAPPING

Circle No. 23 on Reader Service Card for more information



Liquids Shipped in Fibre Drums

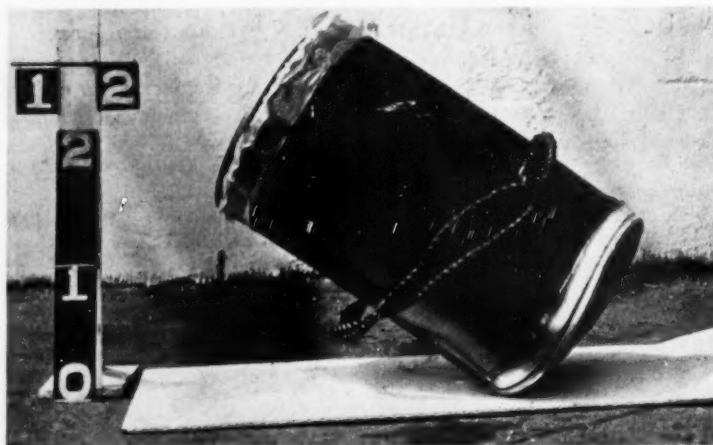


LINER IS TAILORED to fit bottom of fibre drum so that it remains flush without air pockets in all areas of the container.

FIBRE DRUM CARRYING WATER is tested by a series of two 2-foot drops at 45 degree angle onto steel plate. Polyethylene liner remained intact after test and did not leak.

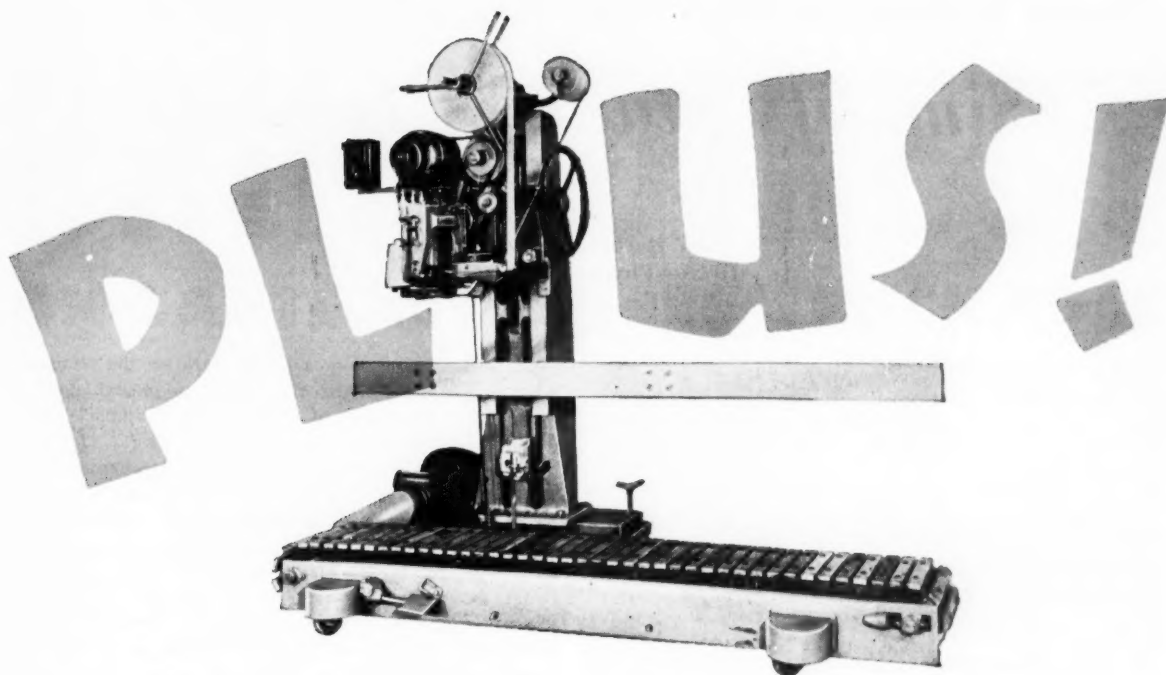
FORMERLY, Rohm & Haas, Philadelphia, used wooden barrels to ship textile and leather dyes. The barrels were expensive initially, and required costly reconditioning. After investigating the possible use of fibre drums for the non-flammable, non-corrosive liquids, the firm helped develop the packaging method shown here.

The package consists of a 55 gal. fibre drum equipped with a separate polyethylene cylindrical liner impervious to, and capable of retaining contents. Pinching, undue stretching or other damage to the liner is prevented by a kraft boot, which is extendable about 25% in any direction, and is placed between the liner and the drum, extending upward about 10-12 inches from the bottom. The open top of the liner is allowed to overlay the top chime of the drum. A disc of the same material and a full-round gasket cemented to the underside of the lid effect a perfect seal, even though the drum is opened frequently. Daily shipments in 400 lb. quantities are made, and between 5,000 and 6,000 units are used each month. Low cost makes liners expendable.



Photos, courtesy Diaphane Corp.

The Bag Closing Machine With a Real



There's an extra PLUS built into every model ET BAGPAKER delivered... the PLUS of assured day-in, day-out top performance.

The Model ET ties in with your existing filling and weighing equipment... closes open-mouth, multiwall paper bags semi-automatically... gives you sift-free, stronger, more economical bag closures with the famous BAGPAK cushion stitch.

You can count on the model ET BAGPAKER to give you faster packaging and better product protection... at lower cost.




Model ET applies famous "Cushion-Stitch" over dry tape for sift-proof closure. Model E-I applies "Cushion-Stitch" only, for use where sift-proofing is not essential.

Check these Economy and Efficiency Features:

- + Closes 15 filled bags a minute.
- + Fast adjustment to bags from 25 to 100 lbs.
- + Completely portable—rolls to any packaging station.
- + Bag starts and stops sewing head when equipped with automatic control.
- + Hoepner No. 150 Heavy Duty Sewing Head with automatic brake to prevent "coasting".

Bagpackers available include models A, D-A, ET, E-I and F-I—with capacities from 60 tons per hour for the Model "A" to the small F-I where large volume is not required.

Write today for details, drawings and capacities to Bagpak Division, International Paper Co., 220 E. 42nd St., N.Y. 17, N.Y., Dept. L-14.


International Paper COMPANY

BRANCH OFFICES: Atlanta • Baltimore • Baxter Springs, Kansas • Boston • Chicago • Cleveland • Denver • Detroit • Kansas City, Kansas • Los Angeles • Minneapolis • New Orleans • Philadelphia • Pittsburgh • St. Louis • San Francisco • Wooster, O. • In Canada: The Continental Paper Products, Ltd., Montreal, Ottawa, Toronto.

BAGPAK DIVISION

Circle No. 81 on Reader Service Card for more information

Vector Nomograph Helps . . .

Simplify Study of Impacts

by

Dr. Harold E. Morgan
Head—Physics Department
Fenn College

THE CONSTRUCTION of a simple impact recording device is such that an impact along the principal axis of the instrument will be recorded. From the calibration of the device, that impact can be interpreted.

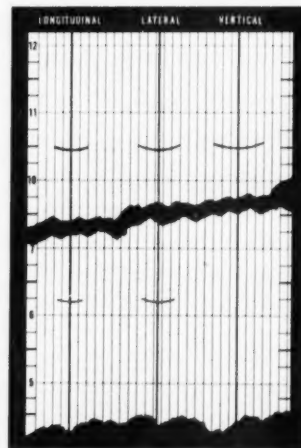
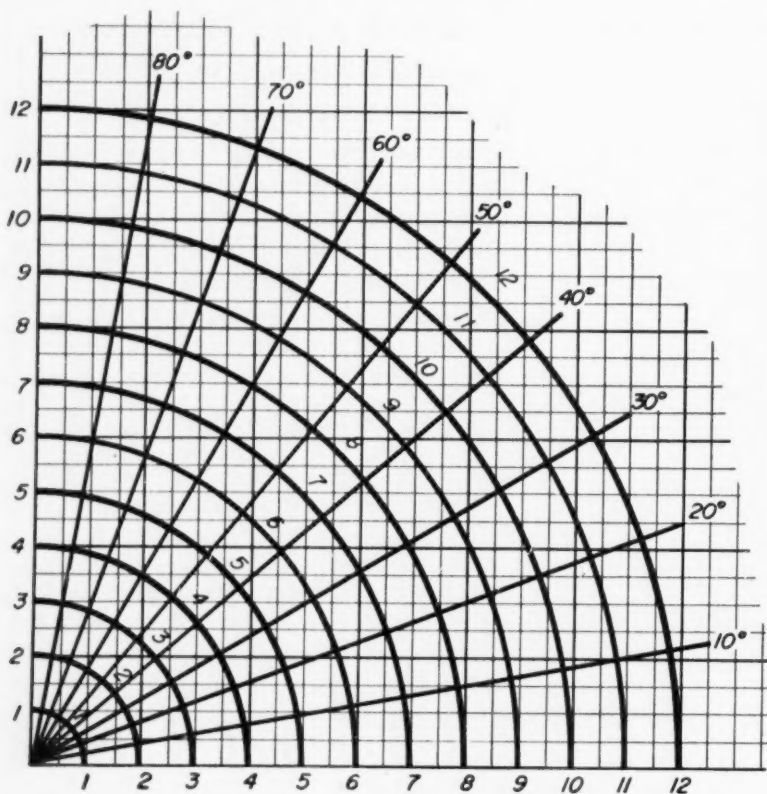
If the same impact were applied at an angle to the axis of the instrument, a smaller deflection would be obtained. In fact, if the impact were to be applied at right angles to the axis, no deflection would occur, and no record of the impulse would show on the device.

It is impossible, then, when the direction of the impact is unknown with respect to the axis of the

unit, to determine from a given mark on the record whether the mark was the result of an impact along the axis or the result of a much larger impact not along the axis.

Impacts are known, in the study of mechanics, as vector quantities and as such are treated in a special way. The deflection, or marking, of each unit on the record of an impact recorder is called a component of the impact in the direction of and with relation to the axis of the unit. An impact can have as many as three components—one in each of three directions; horizontal, vertical, and lateral. Total impact is obtained mathematically by taking the square root of

(Continued on page 114)



RECORDER CHART illustrates the five deflections used as examples in this article. Numbers along left-hand margin are time of day. Each record shows deflection for impact from a different plane.

VECTOR NOMOGRAPH (left) can be used to determine exact direction and magnitude of an impact.

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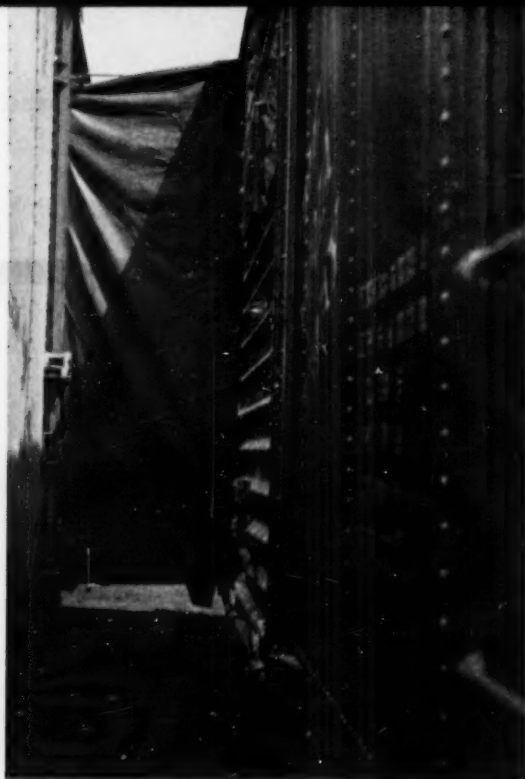


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FLOW • JANUARY, 1954

107



DRY, SAFE PASSAGEWAY is provided by weather screen and magnesium dockboards for handling between two freight cars. The entire installation can be completed in a few minutes without the use of tools.



CANVAS WEATHER SCREENS provide protection against rain or snow when a vehicle is being loaded. They have increased safety of operation and speed of loading in bad weather. Formerly, tie-ups resulted.

Equipment for . . .

Rain-or-Shine Loading

by **Jim McCabe**

Chief Industrial Engineer
The American Maize-Products Co.

WEATHER screens which were installed recently on the shipping docks of our plant in Roby, Ind., have led to the elimination of a troublesome, costly situation which arose every time it rained or snowed.

Come rain, or shine, our plant continues to process corn at the rate of 12 million bushels per year. In moving that tremendous volume to market, loading facilities for both boxcars and trucks are brought into play, and slowdowns on the docks seriously effect other operations. For many years, inclement weather meant an upset to the smooth flow of packaged products from the warehouses or production lines.

Rain or snow, sweeping into the loading platforms, made docks slippery, causing wheels of power equipment to spin. Often, it became necessary to apply



MAGNESIUM DOCK BOARDS are light enough to be set in place by one man. They adjust automatically for differences in height, and let handling equipment operate at top efficiency at all times.

back-straining manpower to help move the loads. Neither the equipment nor the operators functioned at anywhere near top efficiency under those conditions.

Construction of totally enclosed carloading areas was found to be inadvisable due to features of the original structure and layout of the plant. (The plant has been in operation since 1906). The loading docks were canopied, however, thus providing shelter for merchandise and loading crews up to or near the point of entry of boxcars and trucks.

It was finally decided that portable weather screens might provide the most likely solution to our problem. The screens we selected were made of water-and-mildew-resistant canvas and patented metal parts. They can be attached quickly by hand clamps to any standard boxcar door, which then becomes the supporting frame.

The screens have provided us with low-cost, portable protective canopies spanning the uncovered area between boxcars or trucks and warehouse door openings. They assure that there is no loss of operating area, either in width or headroom. In addition, they can be installed in three minutes, without tools, and provide either right or left water drainage control.

In conjunction with the portable weather screens, American Maize has standardized on light weight magnesium dockboards to bridge the span between its loading docks and vehicles. They have further reduced costs by eliminating excessive handling time which was formerly required to move heavy, awkward dock boards. Also, costly accidents to equipment, loads and personnel have been dramatically reduced.

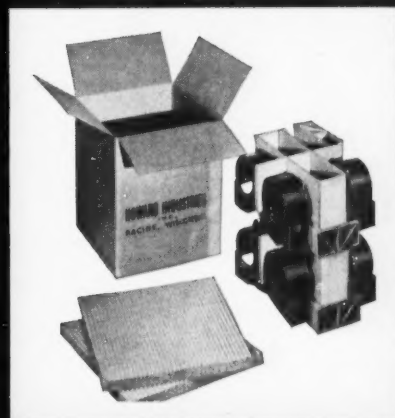
Solution Creates New Problem

While the installation of the weather screens solved a major problem, it did produce another; that of lighting the loading area adequately. Interiors of boxcars and trucks, always dingy at best, become particularly dark and dif-

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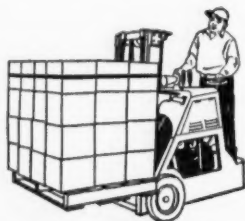


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RAIN-OR-SHINE LOADING

Continued

difficult places in which to work on rainy or snowy days when the screens are put into use. We often find ourselves loading as many as three freight cars on parallel tracks at a single time, or using them as crossovers between warehouses. This is accomplished by connecting from platform to car and from car to car with magnesium dock boards. For weather protection, we install our portable weather screens. The resulting passageways become quite dark.

Safety-assuring lighting, in a hurry is assured to us by the use of coil winder type reel lights. With them, we can spot lights anywhere along one of our temporary passageways as required. We can light up even the farthest corners of all vehicles, to assure safe, fast handling.

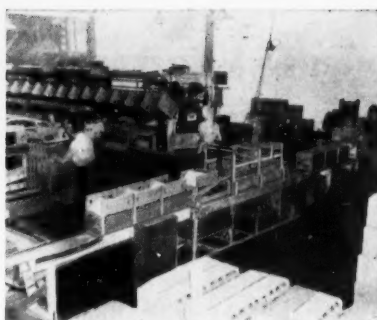
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The author's thanks to Magnesium Co. of America and The Elwing Corp. for their help in preparing the preceding article.



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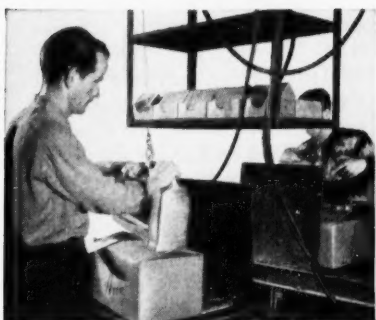
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WAREHOUSING AND SHIPPING

Continued

bottom. This bar operates an engaging device at the top of the mast which reaches up into the drag line conveyor to engage "dogs". To disengage a truck from the conveyor, it is only necessary to depress the pressure bar, fold down the mast, and move it away.

As soon as a platform truck has been completely loaded, it is permitted to travel, without stop, to a checking area, where it is removed from the drag line conveyor and sorted with others destined for the same shipping vehicle.

Checking and Marking

Formerly, marking of outgoing cases was done by case stock men. It was time-consuming and errors occurred too frequently to suit the exacting demands of the company.

Now, all marking is done by the checker. He simply removes the stencil from the invoice, attaches it to a hand duplicator and is ready to start marking each case on that order with name, address, carrier, and invoice number. To expedite marking, all containers are placed on platform trucks with the pre-printed label facing outward by the case stock men.

While marking cases, the checker also compares items with the invoice, to be sure that all called for material has been supplied if it is in stock. At the completion of each order, the stencil, which costs less than one cent, is destroyed.

To the Shipping Dock

After checking and marking all cases, the checker fills out and clips to each platform truck a routing ticket which tells loaders on the shipping dock the following information:

1. Name of the trucking company which will haul material on that platform truck.
2. Identification number of the dock space at which the shipping vehicle will be parked for loading.
3. Johnson & Johnson's invoice number.
4. Number of pieces on the platform truck.

After the checker has inserted

the above information on the routing ticket, and clipped it to the platform truck, he returns the completely loaded unit to the drag line conveyor for movement to the shipping dock.

When the platform truck reaches the shipping dock, its pressure bar once again comes into play. It is usually necessary that a number of these trucks be lined up on the dock, waiting for removal from the conveyor system for vehicle loading. Moving trucks catch up to those which have already stopped. As they meet, the pressure bars on the moving trucks are depressed by the back ends of the ones parked ahead. Depression of the bars causes masts to disengage from the chain conveyor "dogs" above, and the trucks remain stationary. When the pressure bars are released (after trucks ahead have moved again) the contact devices atop masts re-engage, and all trucks move forward until they bunch up again.

After removing all items from a platform truck, a loader unclips the routing ticket, and places it in a holder mounted on a pillar next to the loading spot at which he has been working. The platform truck is then returned to the drag line conveyor, ahead of units waiting for unloading, and permitted to return to the warehouse area for reuse by case stock men.

When a shipping vehicle has been loaded with all cases scheduled for it, all the routing tickets which have been placed in the nearby holder are collected. They are compared with the group of invoices which was originally scheduled for that vehicle. If the total number of pieces on the routing tickets does not equal the total number of pieces on the invoices, an error is indicated and can be quickly identified.

This is the final check by Johnson & Johnson to insure accuracy in filling the orders of its customers. Needless to say, there is seldom any discrepancy between the two totals, and customers get the right supplies, in the right quantities, in a hurry.

FLOW'S thanks to Weber Addressing Machine Co. for help in preparing the preceding article.

WHY SO MANY COMPANIES ARE NO LONGER USING LABELS OR BRUSH-STENCIL



New WEBER SYSTEM for addressing shipping containers does job faster, more accurately, at much less cost

Pictured above is a system that is now accepted as the most efficient method of addressing or marking containers. Time and cost studies taken by present users prove its superiority in speed and economy over less modern methods. It's the Weber Direct-To-Container System.

The cartons have been pre-printed with a label frame by the carton manufacturer. The ship-to address is printed inside the frames at the rate of 40 to 50 cartons per minute with a Weber RJ-1 Hand Printer. (Carrier associations enthusiastically

approve the sharp, waterproof, fade-proof print).

The RJ-1 prints from an inexpensive stencil that can be typed individually or with bill-of-lading or invoice forms as described below. It has a reservoir that holds enough ink for 7,500 to 10,000 prints. Can be supplied with one or two counters for count control.

Find out more about this efficient system for addressing and marking your shipping containers. Send for the folder offered in the coupon.

another

Weber

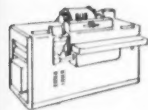
system

Weber Label and Marking Systems
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Typist sticks Tab-On Stencil to form over the "Ship To" area. In one typing, form and stencil are prepared with ship-to address. Stencil then goes to shipping.



Continuous-form, marginal punched stencils are also available. Can be cut on automatic tabulating equipment, electric or manual typewriters.

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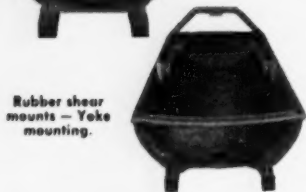
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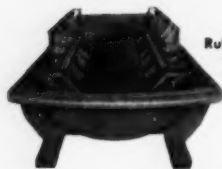
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114

STUDY OF IMPACTS . . .

(Continued from page 106)

the sum of the squares of the three components.

It is the purpose of this article to explain how this result can be obtained without the use of any mathematics. To do this, a Nomograph has been constructed. We will illustrate its use with a 3-styli impact recorder. The instrument records simultaneously, the readings of three styli, each of which records the magnitude of only the impact along its own axis. The axis of each stylus is at right angles to the other two.

Referring to the nomograph, take the simple case of two styli showing deflections, and the third no deflection. Assume that the tape shows three units of deflection for stylus No. 1 and four units of deflection for No. 2. The Nomograph will show along the horizontal axis to point "3", then up the vertical axis to point "4". The intersection of the coordinate lines through these points falls exactly on the circle marked "5". The

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● The Derby Model 32 accommodates any tape from 1" to 3" wide. Delivers from 4 inches to 34 inches of tape at one stroke.

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● Also available is the Model 32-T with tool steel shear-type blades for cutting reinforced strapping tapes. Blades have two cutting edges to double their useful life before resharpening.

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FLOW • JANUARY, 1954

result of adding three units and four units is five units.

Five units is the magnitude of the actual impact. It is also seen that this intersection point lies between two straight radial lines marked 50° and 60° respectively. The point is nearer the 50° line and can be approximated as 53° .

These results can be interpreted in this way: an impact equivalent to five units has hit the package on an edge and at an angle of 53° with the No. 1 axis and 37° with the No. 2 axis.

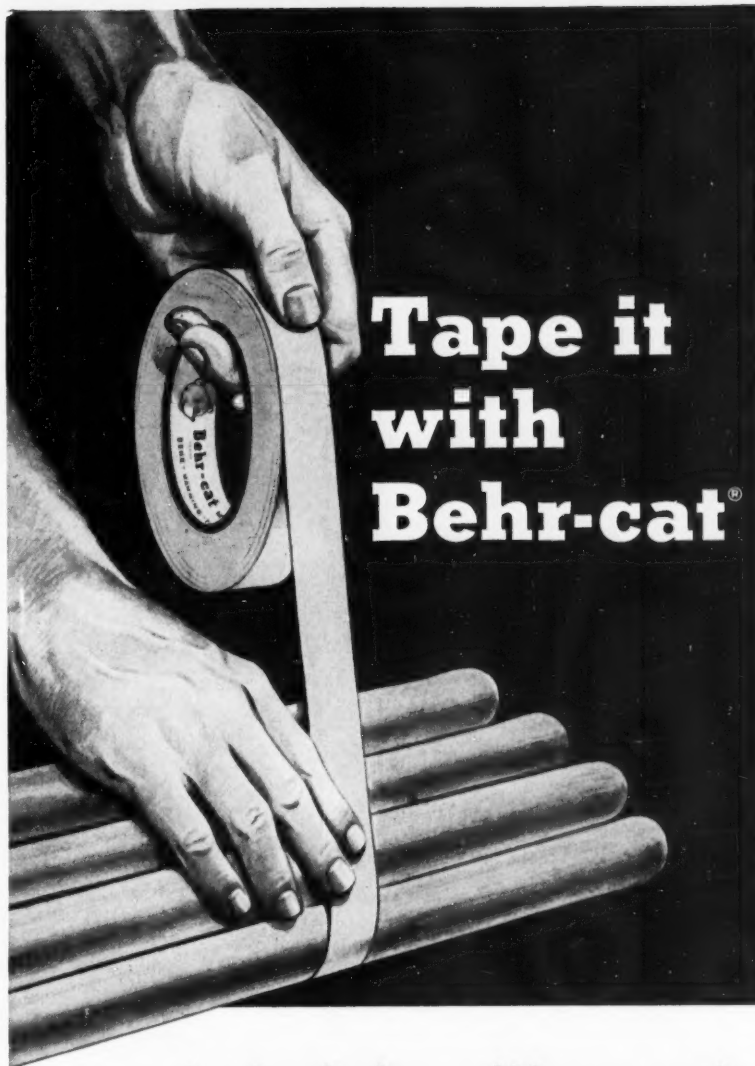
To illustrate the use of the Nomograph when all three styli have registered marks on the tape, let us assume the following readings: No. 1, three units (as before); No. 2, four units (as before), and No. 3, six units. To proceed, take the No. 1 reading of three units and the No. 2 reading of four units, and, as was done in the first example, the resultant obtained above was five units and an angle of 53° . Now, repeat the above process, putting the five units on the horizontal axis and the six units on the vertical axis. The intersection point will be seen to lie between the circle 7 and 8 units. The point is nearer the "8" circle and can be interpreted as 7.8 units. The angle 50° .

Therefore, a single impact caused three simultaneous deflections on the instrument. The impact was 7.8 units in magnitude and was a corner impact 53° from the 31° axis and up to 50° from the No. 1 and No. 2 planes.

The deflection units used on this Nomograph are general and therefore, it would apply to any three-directional instrument. However, results of tests, if they are to be used by groups or related to another group, should be converted from units of measure on a particular machine to standard and accepted units, such as ft. per sec. mph, free fall height, or units of acceleration due to gravity (g).

Once the correct number of spaces is determined for each test, one then refers to the calibration table for findings in either "g" units or mph.

The author's thanks to Impacto-Graph Corp. for permission to reproduce the impact recorder chart which accompanies this article.



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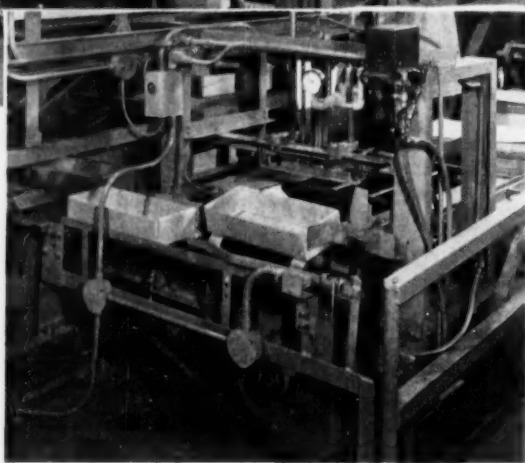
T-3

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**Faster, Lower-Cost
Packaging by . . .**

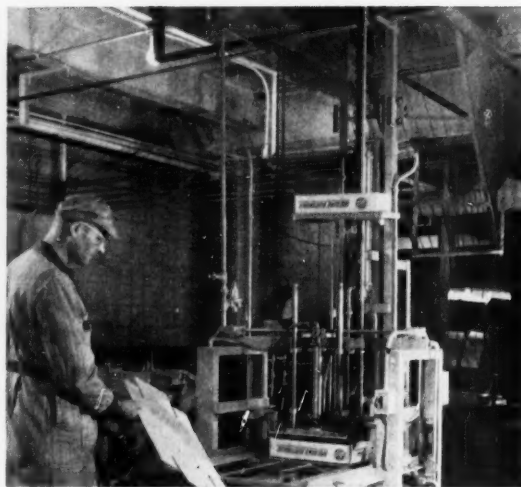
Synchronizing

Two box forming machines, a filling unit, and a conveyor coming from the manufacturing line are all tied together at A. O. Smith Corp. Result; faster packaging, less space requirements for unused container storage, lower costs.



BOX FORMING AND FILLING is done in this department at A. O. Smith Corp., (top photo) Machine at left folds bottoms of Higgins style boxes and unit at right makes tops. Operator in center inspects electrodes coming along conveyor and also supplies corrugated box blanks to feeder bars of forming machines.

BOTTOM FORMING MACHINE (inset) folds bottoms and ejects them onto tray. Then box-bottom moves onto belt-pusher running beneath conveyor filled with electrodes. System works on demand of filling unit.



TOP FORMING MACHINE also works in step with filling of containers. Set-up box tops are elevated as shown here and thrown onto chute which carries them down to a point directly above the end of the conveyor line which moves loaded boxes to closure station.

Box Making... Filling... Production

ECONOMICAL, safe packaging of welding electrodes has resulted from a new packaging method at A. O. Smith Corp., Milwaukee. With a monthly output of approximately 1½ million lb. of electrodes, the manufacturer has long been faced with the need for a faster, more economical way of packaging its products.

Basically, welding electrodes are hard to package. The ceramic coatings of the rods are relatively fragile. Some types of electrodes i.e. those with low hydrogen type coatings) are susceptible to damage from moisture absorption. Boxes of electrodes are generally shipped on end to permit best utilization of freight car space. A "driving" action occurs at the bottom end of the box during periods of vibration in transportation. Thus, the ends are the critical areas on the boxes and call for special consideration in design to prevent failures.

The Container

Electrodes at A. O. Smith are packaged in Higgins style boxes, 50 lb. to each box. They are self-locking, tray-type containers which require no staples, glue

or tape for assembly. With the top in place on a filled box, a total of six plies of corrugated board is provided at each end and two plies on the side walls.

Moisture protection and scuff-proofness are provided by the moisture resistant outer liners of the 300 lb. cylinder kraft from which the boxes are constructed. High stacking strength is another feature of the box, and prevents "grinding-off" of flux during storage or shipment.

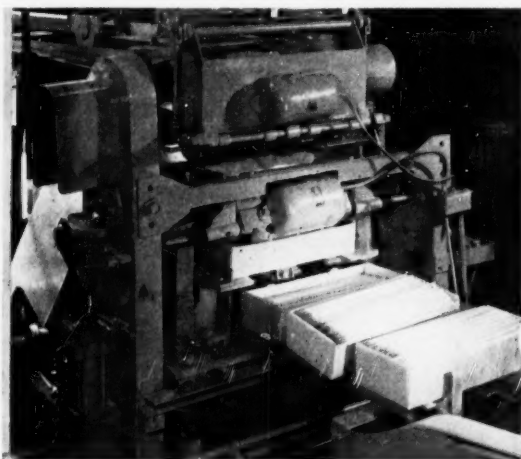
The Packaging Operation

It is in the packaging operation itself that A. O. Smith has realized the greatest cost savings. Electrodes are manufactured in a series of three production lines which incorporate the use of ovens, baking sections and cooling conveyors. The lines operate at 22½ working hours per day, each line producing, roughly, 30,000 boxes of electrode per month.

Packaging equipment consists of three units:

1. A top forming machine; 2. a bottom forming machine; 3. A filler machine which removes electrodes from the conveyor line, weighs them into 50 lb. lots, and places them in boxes.

(Continued on page 126)



FILLING MACHINE designed by A. O. Smith engineers consists of two hoppers with vibrators, and elevator. Empty box is raised to receive electrodes from bottom hopper while top hopper is being filled. Through micro-switches, this unit controls box folding.



CLOSURE AND CHECK-WEIGHING are done at this station. Note, chute for box tops terminates just above conveyor carrying filled bottoms. Wire strapping is applied to boxes to reinforce ends, to keep electrodes from pushing through, and for tight seal.



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Packaging is quicker, costs less, because Green Core Barrier Raps are self sealing, and so flexible they easily conform to any shape. Just wrap around the part and seal with gentle hand pressure.

You can get greaseproof, waterproof Green Core Barrier Raps in various weights and materials. Green Core Cloth Rap meets all requirements of Grade C specifications of JAN-B-121, amendments 1 and 2.

Why not find out whether you can cut costs, provide better protection with Green Core Barrier Raps? Write for free samples, test data, and complete information.

LEADERS IN THEIR LINE

MID-STATES Gummed Paper Company
2511 S. DAMEN AVE., CHICAGO 8, ILLINOIS
New York • Boston • Philadelphia • Cleveland • Detroit • St. Louis • Atlanta • Los Angeles

Circle No. 100 on Reader Service Card for more information
118

**PACKAGING AND SHIPPING
NEW EQUIPMENT . . .**

(Continued from page 99)

Cylindrical Polyethylene Liner

A polyethylene cylindrical liner has been developed by Diaphane Corp., for shipment and storage of liquid and bulk products in quantities



15 gallons and up. The bag-like liner is made from tubular film of any thickness up to 6 mils with tailored bottoms to fit either circular or square containers. Originally designed as an insert for fibre drums, it has also

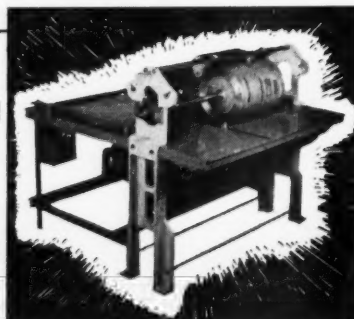
proved of worth to metal drum shippers. The total cost for a liner is less than the cost of reconditioning a metal drum for re-use, according to the manufacturer.

Circle 206 on Reader Service Card for more information

Versatile Hand Stapler

The Rosetto Supertacker, a hand stapler manufactured by J. H. Rosenheim & Co., Scotland,

**practical
answer to the
increasing
importance
of production
line marking!**



The INDUSTRIAL AUTO-PRINTER

Use the Industrial Auto-Printer to print your bags and containers as you need them — to speed up your production and simplify your marking problems.

Completely eliminating expensive hand stencilling, the Auto-Printer has more than met requirements for imprinting, coding, dating, addressing and other marking. Adaptable to almost any size or type of container, it prints at up to 2000 impressions per hour — legibly and accurately.

In hundreds of plants, Auto-Printers are setting appreciable records for saving marking time and labor where efficiency, accuracy and speed are demanded.

We are also prepared to design, develop, engineer and manufacture . . . to the highest standards of excellence . . . units to meet your special needs in marking and coding equipment. Full information and recommendations for your requirements will be sent on request. *Write for catalog.*

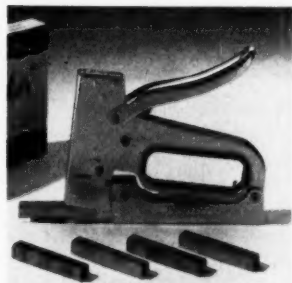
Industrial **M**arking **E**quipment
COMPANY, INC.

454 Baltic Street, Brooklyn 17, New York

MAIn 4-2601

Circle No. 79 on Reader Service Card for more information
FLOW • JANUARY, 1954

offers the unique feature of being able to accommodate three sizes of staples (3/16 in., 1/4 in., 3/8 in.) without any adjustment. It is a one-hand operated unit and is said to be able to drive staples as fast as the hand can grip. It is a front-end loading unit (see illustration) and



holds a strip of 100 staples. In addition to the three sizes of staples which the device uses without adjustment, it can also be adapted for 1/2 in. staples by special modification.

Circle 207 on Reader Service Card for More information

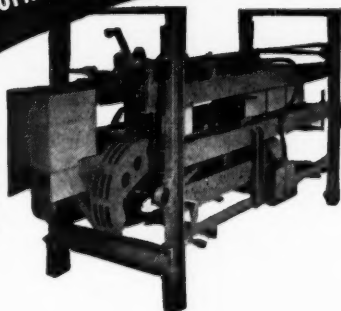
Semi-Automatic Filling Machine

A heavy-duty semi-automatic filling machine that fills products up to the viscosity of putty, has recently been developed by the Filler Machine Co., Inc. The unit was designed particularly to fill all size tubes, cans and glass with such products as glazing putty, caulking compounds, mayonnaise, etc. It fills gallon cans with only one stroke of the plunger and has an automatic rising table that can be adjusted for different size containers to permit filling from the bottom up.

Circle 208 on Reader Service Card for more information
(Continued on page 144)

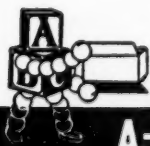
A shorter, narrower,
simpler, and better
performing case sealer

See A B C Sealers
in operation at the
CANNERS SHOW
—January 23-27
—Booth C-19



THE NEW A-B-C Junior CASE SEALER

The A-B-C Junior Case Sealer automatically seals corrugated shipping containers in only a fraction of the floor space ordinarily required. Operation is fast—trouble free—economical. A completely new flight chain construction virtually eliminates carton jamming... Three semi-automatic models are available to fit most case sizes. Write today for details and floor plans.



A-B-C PACKAGING MACHINE CORP.
QUINCY, ILLINOIS

Circle No. 10 on Reader Service Card for more information
FLOW • JANUARY, 1954

Only FIBREEN

TAKES THIS BEATING...



...and COMPLETELY PROTECTS YOUR SHIPMENT!

For shipping metal goods, textiles, furniture, leather, rubber, wood products, foods in containers, etc.

Fibreen gives you

● **Protection against rough handling**—Rugged Fibreen resists rips, cracks, and punctures—it's reinforced with tough, closely cross-laid fibres of steel-like strength.

● **Protection against water and moisture**—Double-layers of highest quality, waterproof, pliable adhesive prevent moisture penetration.

● **Protection against dust and grit**—Both top and bottom sheets are surface-treated top-grade No. 1 Kraft.

—and Fibreen is

● **Easy-to-handle**—It's flexible and is quickly formed around contours. Saves time and labor.

● **Light weight**—Makes a compact package—reduces shipping and storage costs.

● **Low in cost**—Available in widths of 36", 42", 48", 54", 60", 72", 84", and 96" ... also with a new non-asphaltic adhesive.

SEE FOR YOURSELF! Send for free samples of Fibreen—specialized for different shipping problems... in asphaltic and non-asphaltic grades. Test them yourself! If you'd like a free 28-page book covering packaging methods in almost every industry, please indicate. Write Dept. F-1.



A product of
THE SISALKRAFT CO.
Chicago 6, Ill.

New York 17, N. Y. • San Francisco 5, Calif.

Circle No. 134 on Reader Service Card for more information

SAVE 20%
on sealing costs!



"Dial" gummed tape electrically

The new Marsh Dial-Taper is real news to users of gummed tape. Dispenses all kinds, in widths to 3", electrically. Select your length on the telephone-type dial, dial it, and out it shoots moistened with warm water. Sticks instantly. Saves 1/5 on tape, often more in man-hours.

For more information or a free demonstration mail us this ad with your name and business letterhead

MARSH Electric
Dial-Taper

MARSH STENCIL MACHINE COMPANY
67 MARSH BLDG. • BELLEVILLE, ILL.

**MACY'S OVERHAULS
HANDLING . . .**

(Continued from page 89)

The palletization program has been worked out on the basis of the most practical application for each type of merchandise. An obvious example is the palletized movement and storage of unit loads of groceries. The variety of warehouse items and the variation in inventories required careful study of the storage layouts. Large volume merchandise is palletized and stored in pallet rows with due regard for lot size, storage depth, turnover rate and item characteristics. Smaller volume goods are stacked on pallets in pallet racks, which are designed for dual use of either pallet or hand-piled loads. The pallet areas are kept flexible to take full advantage of seasonal space requirements. Rewarehousing is an important consideration, and palletized merchandise is now quickly shifted to affect space consolidations.

Furniture stock is generally stored in special wooden racks.

These are padded to protect the expensive wood finishes, and dust covers are provided for the upholstered items.

Fast moving, upholstered furniture undergoes a minimum of re-handling by use of special rolling pipe racks. Incoming furniture, tagged for next day delivery, is placed on rolling racks at the receiving dock and remains on these racks through storage, furniture finishing and delivery accumulation. Racks, on large diameter, easy rolling casters, carry a sofa and three chairs, or two sofas.

China and glass stock is opened in a special uncrating area, inspected, and moved via rubber-tired trucks to the bin area. The open stock is stored in carefully sized wooden bins.

Racks and bins have been provided for the storage of such diverse items as linoleum, cartons, housewares, radio parts, mattresses, etc.

The guiding storage principle of the new system is flexibility of facilities and equipment.

**ITS FELT TIP WRITES
ON EVERYTHING!**



in **BOLD** or *fine* lines

Marking steel drums, tools, parts, pipes, etc. is smooth sailing with the Flo-master Felt-Tip Marker.

The complete range of ten colors in Flo-master Inks permits speedy and accurate identification for assembling, stocking, inspecting.

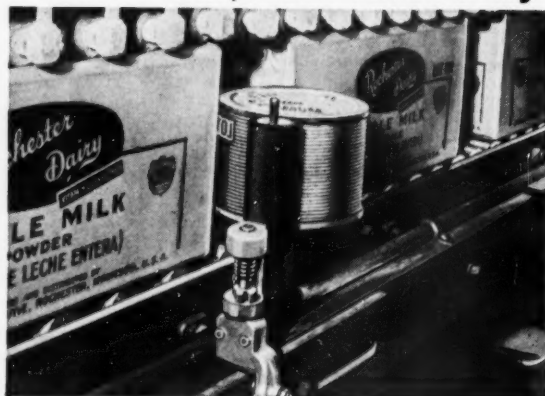
Flo-master semi-opaque inks — waterproof, non-smudging, fast-drying — are recommended for hard-to-mark surfaces using the KING SIZE Flo-master. For general purpose marking—cartons, cases, etc.—use Transparent Inks with POCKET SIZE Flo-master (illustrated).

Contact your supplier or write direct to Cushman & Danison Manufacturing Co., Dept. F-12, 153 West 23rd Street, New York 11, N. Y.

Flo-master
FELT-TIP MARKER

Circle No. 41 on Reader Service Card for more information
120

**Low-cost conveyor attachment
marks cartons, cases automatically**



Save man-hours now used for manual marking. Attach a ROLACODER Imprinter to conveyor or case-sealer and eliminate the cost of stencilling or rubber-stamping. Get neater, cleaner, more accurate marking, too. Friction-operated, self-inking. Copy changes made in minutes. Pays for itself in weeks.

Write for ROLACODER brochure showing models to imprint top, sides of every kind of package.

ADOLPH GOTTSCHO, INC.
Hillside 5, N. J.

Gottscho

Circle No. 65 on Reader Service Card for more information
FLOW • JANUARY, 1954

Carpet Workroom

The carpet workroom required ample storage space plus large cutting floor areas. The tenth floor of the warehouse offered good elevator service and plenty of floor area, but it had the serious drawback of a low ceiling. This low headroom prevented the ready application of any of the several commercial carpet handling systems.

To overcome this building restriction, the workroom manager and the engineers designed an arrangement of roller conveyor storage racks. These racks produced the fullest use of available cube, made it possible for one man and a fork truck to handle 800 lb. carpet rolls, but made no attempt to eliminate all labor. The carpet rolls are easily moved to the cutting floors on roller dollies or roller tables. The storage racks are arranged so that heavy rolls are placed in the low racks and the lighter rolls (as cutting continues) are placed in the higher racks.

Wrapping And Packing

The warehouse fills many sales checks forwarded from the main store and branches. This operation insures faster delivery to the customer and eliminates multiple handlings of the merchandise. Many merchandise items are received, stocked, picked and wrapped or packed in the warehouse. To encourage the further development of warehouse order filling, an extensive modernization of facilities was undertaken. The wrap and pack operation was organized in definite locations, and the benches and other facilities were standardized. A 300 foot belt conveyor was installed to carry completed packages from the main wrapping area down to the delivery sorting slide. The order filling operation has become smoother and easier and the long conveyor provides direct transportation.

Delivery

Customer orders are picked on the various warehouse floors and then transported via elevator or conveyor to the appropriate delivery areas on the first floor.

Delivery truck pick-ups are made in accordance with carefully scheduled movements to the sorting stations and delivery zones.

Results Of Overall Program

The overall warehouse modernization program has achieved a most effective use of a multi-story building. This goal was very important as the geographic location of the warehouse makes its continued employment very desirable. The new building layout, operating methods and material handling equipment have been coordinated into one smooth running operation from receiving through delivery. As the actual method of achieving such a modernization program may be a helpful future guide for solving warehouse problems, it is outlined below.

Warehouse Program Procedure

Planning: Warehouse management and the engineers laid out a study program to evaluate and solve existing and future warehouse problems. A report on the findings, prepared and presented to management, covered objectives, results, methods, costs, savings and a time schedule for installation.

Installation: Following management approval, a time schedule was established and the program set into operation with an industrial engineer appointed as a project director responsible to management for schedule completion, budget control, engineering design, materials specification and requisition coordination with the store purchasing department.

Operation: As each installation was completed it was carefully inspected and any bugs were ironed out at once. The standard to be met by all equipment and methods was the ability to perform practical daily warehouse operations.

Results: The accomplishment of the completed program was a tighter, smoother warehouse operation with a 23 percent improvement in space use and 15 percent faster service to customers.

FLOW'S thanks to Paul D. Crawl, Macy's Warehouse Manager; and Ralph S. Crummé, Abbott Merkt & Co.

ROBO-LIFT

HANDLES FOOD PRODUCTS

GENTLY

NO DIGGING
NO SCOOPING
NO SPILLING
or
BREAKING

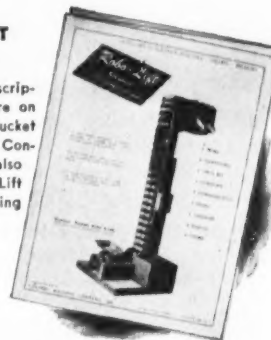


Standard Model A-1070 with 8 cu. ft. hopper. Stainless Steel in contact with product.

- Gentle vibratory motion handles many dry products . . . Drugs, confections, foodstuffs, chemicals, pharmaceuticals, etc.
- Product touches only stainless steel.
- Standard hopper shown is not integral part of conveyor, can be made portable.
- "No-spill" buckets invert to discharge. Angle of discharge variable.
- All parts easily accessible. Entire conveyor can be enclosed if desired.
- Many variations of basic models possible.
- Save labor, time, floorspace.
- Preserve fragile products from damage.
- In use by Beech-Nut, Buitoni, Kellogg, Kraft, Lipton, Post Cereals, Brach, Rockwood, Sharpe and Dohme, Safeway Stores, Lance, Inc., A. & P., Salada Tea Co., Campbell Soup, and many other leaders.

MANY DIFFERENT MODELS

Write for descriptive literature on Robo-Lift Bucket Elevating Conveyor and also the Robo-Lift Tray Elevating Conveyor.



Capacity Range up to 25 cu. ft. per min.



Circle No. 39 on Reader Service Card



What's NEW

in useful FREE literature

These publications, written by experts, are FREE. Indicate your choice on the self-mailing Readers Service Card.

For Government Packaging:

Literature describing Induwrap—an anti-corrosion barrier material, may be requested from its manufacturer, Angier Corp. The grease-proof grade A barrier is said to meet amendments 1 and 2 of government specifications JAN-B-121.

Circle 215 on Reader Service Card

Magnetic Elevator:

Prab Conveyors Inc. has literature available showing how its Magnavator operates. It is said to be a completely automatic elevator for handling small parts magnetically.

Circle 216 on Reader Service Card

Flat Carton Marking:

How to automatically feed and mark flat folding boxes or other flat wrapping materials is illustrated in a catalog sheet available from the Markem Machine Co.

Circle 217 on Reader Service Card

2-Way Communications:

Two catalogs are available from the Radio Corporation of America describing its UHF Desk station equipment and its UHF Mobile Radio. Both sets are designed to operate in the uncrowded ultra-high frequency band recently assigned by the FCC to 2-way communications use.

Circle 218 on Reader Service Card

Attachment Versatility:

How to add greater capacity and operating efficiency to your lift trucks through the use of attachments is outlined in literature obtainable from Lewis Shepard Products. Featured is the hydraulically operated Side Shifter which moves a load horizontally without moving the truck.

Circle 219 on Reader Service Card

Aluminum Foil Protection:

A new booklet has just been published by Reynolds Metals Co. to be used as a guide to the use of aluminum foil as an effective packaging material. Included are such technical information as charts and tables comparing the moisture vapor transmission rating of foil to other packaging materials, and tables to assist in the proper selection of foil specifications relative to the amount of protection required.

Circle 220 on Reader Service Card

Rugged Duty Tires:

A 24-page illustrated booklet showing a variety of off-the-road tires performing rugged service has just been released by the B. F. Goodrich Co. Every off-the-road tire in the BFG line is pictured in actual service.

Circle 221 on Reader Service Card

Diesel Tractor Book:

Packed with facts, a new booklet containing all the specifications and features of the Diesel D6 track-type tractor, may be obtained from the Caterpillar Trac-

tor Co. The booklet also suggests other equipment and attachments that may be used along with the tractor.

Circle 222 on Reader Service Card

Powered Hand Trucks:

A new catalog No. 5 may be obtained from Lift Trucks Inc. It is a handy guide to the company's line of material handling equipment and provides information on all the latest features in electric powered hand lift truck design.

Circle 223 on Reader Service Card

Caster Catalog:

Yours for the asking is the new 1954 industrial caster catalog of the Albion Industries Inc. It contains detailed illustrations and complete specifications plus many helpful cost-cutting suggestions.

Circle 224 on Reader Service Card

Load King Hoist:

A new eight-page booklet has been released by the Yale & Towne Mfg. Co. describing its Load King electric hoists. The line ranges in capacity from 1/4 to 1-1/2 tons. Advantages of the Load King are said to be its light weight, maximum practical use of ball bearings, push-button control and fast lifting action.

Circle 225 on Reader Service Card

Easier With Load-Mobiles:

Market Forge Co. has released a beautifully illustrated booklet showing work applications which can be tackled with its line of

Load-Mobile trucks. The 18-page booklet provides complete details for all five models in the line.

Circle 226 on Reader Service Card

Unitize for Big Savings:

"Six Basic Ways of Unitizing" is the name of a brochure available from Signode Steel Strapping Co. Reprinted from an article by James R. Williams of Signode, the literature reviews the types of unit load and tells how you can adapt them to practically any type of operation to achieve better, less costly and faster shipping.

Circle 227 on Reader Service Card

Box Car Loading:

Some interesting and colorful literature is available from the Manierre Engineering & Machinery Co. covering applications for its box car loader. Included is a brochure of pictures showing equipment in operation. It is entitled "Keeping Pace with Progress."

Circle 228 on Reader Service Card

Conveying Through Tubes:

Hapman Conveyors Inc. have released a detailed catalog folder giving complete specifications for its tubular conveyor. Special feature of the unit is its sealed pin chain design said to keep maintenance at a minimum. Compressed neoprene washers keep harmful abrasives away from the conveyor chain.

Circle 229 on Reader Service Card

Expendable Pallet:

Mead Board Sales Co. has released a colorful folder showing how Poke-Pak is used for palletizing loads safely and economically. Their extremely low cost makes them truly expendable, says the manufacturer, since they completely eliminate the need for wooden pallets.

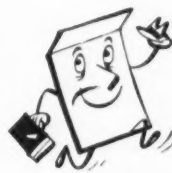
Circle 230 on Reader Service Card

Prices And Info:

Prices for every type and size of woven wire gripper sling are contained in the new price and

How MEAD POKE-PAK*

works to cut costs
for those who receive
goods in multiwall bags

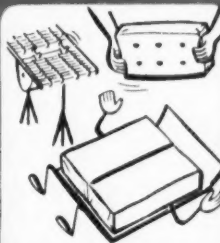


Delivered with creased flaps, ready for immediate use.

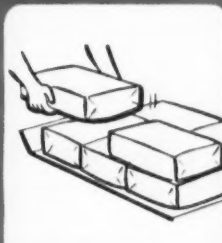
30 can be stored in the space needed for one pallet.



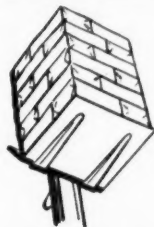
Poke-Pak is light in weight—easy to handle.



Load is unitized with non-tear adhesive.



Load is stacked with interlocking pattern.



Load is securely fitted as a unit.



Safe arrival! Sides are and straight. No torn bags.



Bags are easily separated without damage.



So inexpensive it can be discarded after use.

These advantages will save you money from the day you begin receiving loads unitized on MEAD CHESTNUT POKE-PAK. Over the business year, they will add up to substantial gains from lessened claims, and demurrage, faster release of unloading facilities, easier and more accurate inventory taking, cleaner plant. If you receive materials in multiwall bags, there is no surer economy than to unitize on POKE-PAK. Write for an illustrated folder on the advantages of MEAD CHESTNUT POKE-PAK.

MEAD BOARD SALES, INC.
LYNCHBURG 3, VA.

Offices: Cincinnati • Chicago • Newark

*Trade dress

MEAD
board

Circle No. 150 on Reader Service card for more information

data book available from Cambridge Wire Cloth Co. Included also are numerous pages of photographic illustrations showing the slings in use for varying purposes.
Circle 231 on Reader Service Card

Color Movie Available:

Baldwin-Lima-Hamilton Corp. has announced the availability of a new 16 MM color sound film entitled "The Loggers' Giant." Featuring its construction machin-

ery, the movie was filmed in the Pacific northwest. It is a narrative-type travelogue showing Lima machines in action and telling the story of the logging industry.
Circle 232 on Reader Service Card

Industrial Trailers:

Specialized trailers for trackless trains for use within or between plants is described in Bulletin No. A-999 available from the Mercury Mfg. Co. Complete speci-

fications for each model trailer car is presented in detail.

Circle 233 on Reader Service Card

Condensed Catalog:

Illustrations, descriptions and specifications for over 100 different types and sizes of portable hoists are contained in the eight-page catalog now available from the Coffing Hoist Co.

Circle 234 on Reader Service Card

25 Hand Truck Models:

A new two-color, eight-page bulletin, featuring hand trucks designed for cost saving applications in dairies, produce plants and other small industries has been announced by Nutting Truck & Caster Co. Specifications and other helpful particulars are included for the complete line numbering 25 different models.

Circle 235 on Reader Service Card

Steel Platforms:

A quick look into the Powell Pressed Steel Co. line of lift truck platforms is provided in a new brochure available from the company. The heavy-duty corrugated steel units also are manufactured as bulk containers with hooks for hoisting, casters for wheeling, or with dump-bottoms for unloading speedily.

Circle 236 on Reader Service Card

6000-Pounder:

A two-color four-page folder recently released by Elwell-Parker Electric Co. describes in detail the 6000-pound electric fork truck type F-31T. It has a front-wheel drive, rear-wheel steering, and is a tiering, tilting, telescoping model.

Circle 237 on Reader Service Card

Mark Whatever You Make:

A four-page brochure issued by Adolph Gottscho Inc. gives complete data on various models of machines for marking, coding or dating packaged products. Machines are said to range from manually operated to fully automatic models that can print in two

NOW! A FREIGHT ELEVATOR ON THE BACK OF YOUR TRUCK... with only one lever, one cylinder TO DO ALL OPERATIONS

Efficient material handling into and out of trucks is now at its peak of perfection. So simple—so safe one man can handle loads up to 4000 lbs.—at one time. Load or unload anything, anywhere. Anthony design eliminates time-consuming operations—does this without extra cylinders, valves, controls, etc. A complete range of capacities for all trucks and semi-trailers.

New Brochure shows HOW you can save up to 50% on your trucking costs. Send for your copy today.

POWER

OPENING
CLOSING
LIFTING
LOWERING



Patd. & Pat. Pend.
U.S. and Foreign

ANTHONY LIFT® GATES

The Power to lower delivery costs

ANTHONY COMPANY • STREATOR, ILLINOIS
DEPT. 15P

Circle No. 6 on Reader Service Card for more information

colors and on as many as five sides of a carton.

Circle 238 on Reader Service Card

Steel Floor Tiles:

An illustrated folder describing Metile steel floors is obtainable from Flash-Stone Co. The steel tiles are said to provide a long-lasting floor surface for areas subjected to extremely heavy and abusive traffic. The materials used and the methods of installation are explained in the folder.

Circle 239 on Reader Service Card

Industrial Brakes:

An 8-page descriptive brochure which lists some of the applications of the Goodyear airplane-type disc brake for industrial uses is offered by Goodyear Tire & Rubber Company's industrial brake department. The brochure points out that these brakes can be adapted to almost any machine, and can be operated hydraulically, mechanically or pneumatically, or can be spring-set, solenoid-released.

Circle 240 on Reader Service Card

Rectifier Applications:

A brochure explaining the application of rectifiers to various operations has been made available by the American Rectifier Corporation. The company has taken note of questions most frequently asked and has now compiled them, with their replies, in this question-and-answer folder.

Circle 241 on Reader Service Card

Disc Type Valves:

Bulletin 1000 from Ledeen Manufacturing Company describes and illustrates the complete line of Ledeen valves. The bulletin includes illustrations, operating and circuit diagrams, dimensions and weights.

Circle 242 on Reader Service Card

Self-Cleaning Filter:

Industrial Filtration Company offers a folder containing information on its gravity type filter. Called the Delpark, this filter gives continuous, full-flow, self-cleaning, fully automatic filtration.

Circle 243 on Reader Service Card

Cross-Creped Kraft:

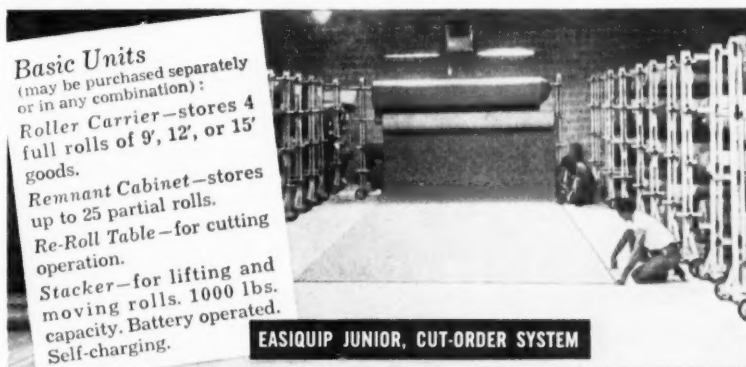
"The Story of Two Knives" is a bulletin available from Cincinnati Industries, Inc. The 16-page booklet highlights specific problems and describes how Cindus X-Crepe, which is a cross-creped kraft product, can be coated, impregnated, laminated with cloth, fibres, films, foils or other layers of X-Crepe to impart special qualities.

Circle 244 on Reader Service Card

Polyethylene Plastic:

Information about the properties, applications and methods of fabricating Bakelite polyethylene plastic is presented in a 24-page booklet published by Bakelite Company, a division of Union Carbide and Carbon Corporation. It emphasizes with photos and data the use of polyethylene for producing squeezable bottles.

Circle 245 on Reader Service Card



Basic Units
(may be purchased separately or in any combination):
Roller Carrier—stores 4 full rolls of 9', 12', or 15' goods.
Remnant Cabinet—stores up to 25 partial rolls.
Re-Roll Table—for cutting operation.
Stacker—for lifting and moving rolls. 1000 lbs. capacity. Battery operated. Self-charging.

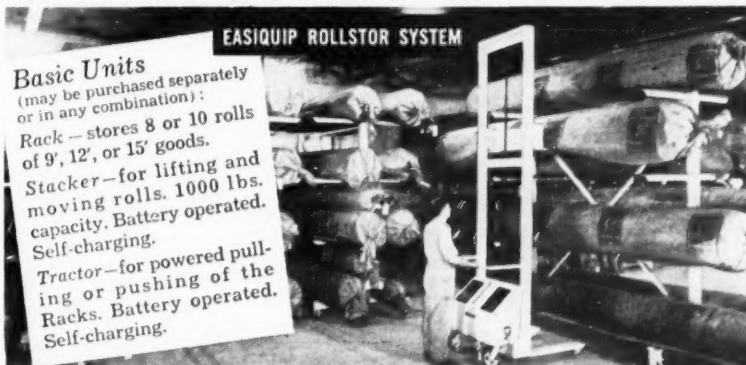
EASIQIP JUNIOR, CUT-ORDER SYSTEM

EASIQIP

for Handling and Storing Roll Goods

- Up to 50% more storage in the same warehouse space.
- One man can store a carload of roll goods in 1 hr., 20 min.
- Two man team can average 100 cuts per 8 hr. day.
- Makes it possible to locate any roll in seconds.
- You assemble and install yourself.
- Lowest initial cost per roll.
- You can start small and build to any size by ordering additional standard units from stock.
- Self-supporting. No construction changes or special permits required.
- Units easily re-arranged to meet changed conditions.
- All equipment guaranteed for one year.

*** Greater Efficiency * Greater Economy * Greater Flexibility**



Basic Units
(may be purchased separately or in any combination):
Rack—stores 8 or 10 rolls of 9', 12', or 15' goods.
Stacker—for lifting and moving rolls. 1000 lbs. capacity. Battery operated. Self-charging.
Tractor—for powered pulling or pushing of the Racks. Battery operated. Self-charging.

EASIQIP ROLLSTOR SYSTEM

Manufactured by the Makers of Roberts SMOOTHEDGE
EASIQIP COMPANY 1522 NO. INDIANA ST.
LOS ANGELES 54, CALIF.
Write Concerning our Free Layout and Engineering Service and Name of Nearby Representative

Circle No. 54 on Reader Service Card for more information

Barrel Cart:

Hodgson Engineering & Manufacturing Company offers literature describing its barrel cart for mixing, moving, pouring and emptying. Complete description, typical uses, specifications and price are listed.

Circle 246 on Reader Service Card

Portable Lifts:

Literature from Safeway Industrial Equipment Corporation describes this company's portable

lifts, which are available in several models, either hydraulic power or battery-operated hydraulic power. Circle 247 on Reader Service Card

Code Marker:

Ideal Stencil Machine Company offers a bulletin on the Handy Printer, a printing attachment which can be installed on the Ideal Clip-A-Tape gummed tape dispenser. The printer code-marks the gummed tape, and the printed message can be changed by changing printing rollers.

Circle 248 on Reader Service Card

SYNCHRONIZED PACKAGING . . .

Continued from page 117

Previously, between five and seven men had to be pulled from other jobs periodically to assemble tops and bottoms of the Higgins boxes. The set-up containers were then stored on the floor, creating a serious space problem. Both of these problems have been solved.

The packaging operation works completely on a demand basis with control point at the filler machine. A top and bottom are folded each time a filled container moves away from underneath the filling hopper.

Filling Machine

The filler unit was designed by engineers at A. O. Smith. Positioned at the end of a belt conveyor coming from the electrode manufacturing line, it consists of two hoppers positioned one above the other, each with a vibrating motor mounted on the side.

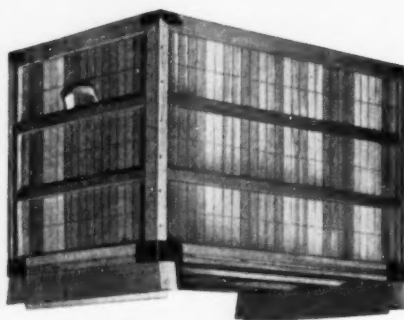
The top hopper weighs electrodes as they enter it from the belt conveyor. When 50 lb. of product has been reached, a stopper operates to cause electrodes on the conveyor to bunch up. In the meantime, a mouth at the bottom of the upper hopper hinges out and drops the 50 lb. of electrodes. When it closes, it permits material on the belt to start loading again.

Meantime, as the upper hopper is being re-filled, material from the bottom hopper is being vibrated into a box which was elevated into position during the first filling of the upper hopper. After the lower hopper has emptied, its hinged mouth closes and the filled box lowers back down to a belt-pushed conveyor which carried it from the bottom folding machine in the first place. The speed of this conveyor is controlled by the filler unit, and the speed of the box forming machines is in turn controlled by the speed of the conveyor.

Box Forming Machines

As previously mentioned, two folding units are used with each filling unit. One forms the Higgins box bottoms, and the other forms tops. They are both pneumatically activated machines, operating at

an eye for faster production



LEWIS Containers

this famous skid box has been an eye opener in major industries from coast to coast. They stack ceiling high to give that extra storage space and rapid inventory control. These skid boxes challenge heavy loads with ease. No wonder they can handle the toughest job . . . firm, yet resilient, elm slats locked in heavy galvanized steel wire . . . hardwood frame, bound by dovetailed joints, reinforced with metal corner irons. They're built for service . . . designed for the job with an eye on additional profits for you. Write for folder.

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LEWIS
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70 p.s.i. pressure. Their operation is controlled entirely by micro-switches which not only co-ordinate the whole packaging operation, but also insure that a box is not formed unless the blank has been properly positioned. Thus, waste of material which might result from improper positioning is eliminated.

Both units are fed manually by one operator who also controls the filling equipment and inspects finished electrodes which are ready for packaging.

Bottom Forming—As a filled box leaves the filling unit, it actuates a micro-switch which causes a box blank to move into the forming section of the bottom folding machine. When it has been positioned accurately, the downward stroke of a ram is started. This first stroke forms the box into shape. As soon as the ram reaches the bottom of its stroke, it returns to its starting position to start another stroke into the same box.

At the beginning of the second stroke, air cylinders at the ends of the box are activated to push in lock flaps to a position 90° to the side of the box and paralleled to the ram. Then, as the ram continues its second downward stroke, it forces the flaps down. They are held in place after that by a friction lock.

The complete box is ejected onto a chain conveyor section which carries it to belt-pusher which is underneath the belt carrying electrodes ready for packaging. All parts of the system are synchronized to move on demand. Every time a box is filled, it results in a new box being made, and in all other boxes along the line moving one step nearer the filling point.


Top forming—Again, the demand system controls operation of the top forming equipment. As each box top is completed, it is ejected onto an elevator conveyor which carries it upward and throws it onto a chute. The lower end of the chute terminates directly above the conveyor carrying filled boxes from the filling machine at that point, tops are placed on

the boxes, which are then check-weighed and wire strapped for additional strength.

The entire operation proceeds at a pace of about 15 boxes per minute. Only two operators are required, one at the box-making and filling equipment, and the other at the check-weigh, strapping point. The first man is in reality an inspector who would have been required regardless of the method

of packaging utilized. However, the mere inspection of electrodes doesn't occupy his full work period and the additional tasks of supplying blanks to the feeding bars of forming machines is not an excessive operation.

For information used in the preceding article, FLOW thanks Gaylord Container Corp., manufacturer of the box-forming machines (which are subject to patent pending application) and the Higgins box used by A. O. Smith.



TURNABOUT[®]
ADJUST • A • FORK
HYDRAULIC LIFT TRUCK
with interchangeable forks

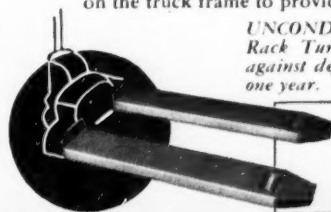
As low as
\$350
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capacity
 2500 lb.

At last, improved design and mass production techniques give you a quality product, properly priced. The Turnabout will immediately prove its superior performance with extra strength where needed most . . . high maneuverability . . . ease of operation. Resinoid type casters and aluminum leader wheels at no extra cost.

INTERCHANGEABLE FORKS: Easily interchangeable forks are available in five standard lengths. They may also be adjusted on the truck frame to provide 25" or 27" width.

UNCONDITIONALLY GUARANTEED: The Rack Turnabout is unconditionally guaranteed against defects in workmanship or materials for one year.



TRUCK COMPLETE

- With either 30", 36", 40", 42", or 48" forks **\$350**
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BULK MATERIALS . . .

(Continued from page 81)

The system is designed to unload material from the boxcar into the silo at a rate of approximately 100 pounds per minute.

Next step in the operation is to move the lime from the bottom of the silo to the "day bin", which introduces the pebbled lime into the water softening device, an Omega belt-type gravimetric feeder.

The vacuum feeder is attached

to an Omega valve at the bottom of a cone under the silo. This valve is a drum type unit which can be adjusted to control the amount of material flowing into the vacuum feeder. The feeder itself is very sensitive; if too much material is allowed to drop into the unit, it will tend to clog the lines and the entire system. Material is dropped into a section of pipe approximately seven inches from the end where the air enters. Air is mixed with the material as it drops into the 4 inch pipe to

be conveyed to the primary separator located on the roof of the main plant building.

Approximately 95 percent of the material is taken out of the air stream in the primary separator. (Fine dust remaining is conveyed from the primary separator to the secondary separator and taken out by the filter bags. The air then returns to the exhaustor, located on the ground floor). When the primary separator is filled with material—in about three minutes—the Omega valve in the bottom of the silo is turned off and lime allowed to clear. Then the air is turned off. A slide valve on the bottom of the primary separator is then opened, allowing the material to drop into the day bin located on the second floor of the building. From the day bin, the lime is introduced into the Omega feeder. The primary separator has a storage capacity of 12 cubic feet.

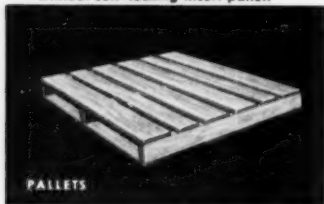
B-G FOR SAFE HANDLING AND SHIPPING



MODEL A
Pallet Box is easily attached to any standard pallet by means of 4 corner irons and flat or round steel strap. Collapsible for storage and return shipment.



MODEL B
This collapsible pallet box has front opening for easy access to contents when stacked or in racks. Furnished with or without self-locking insert panel.

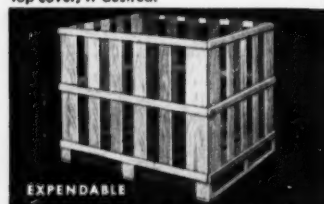


PALLETS
Hardwood pallets made in all sizes and styles. Nailed with cement-coated drive screws.

For greater strength in stacking, materials handling and shipping, use Bigelow-Garvey Tight-Corner Collapsible Crates and Pallet Boxes. Designed to withstand transportation and handling hazards, B-G containers are extra strong for stacking and ideal for storage. Shipped in two or three sections. Fully assembled. Pre-drilled nail holes enable quick packing. Let us design sample container to meet your requirements.



MODEL C
B-G Collapsible, hinged pallet box with drop-leaf panel for greater accessibility. All B-G pallet boxes can be furnished with top cover, if desired.



EXPENDABLE
B-G expendable pallet box, designed to withstand specified loads. Inexpensive, permitting discard after usage. Top cover, if desired.



TIGHT CORNER CRATE
The collapsible crate with the exclusive B-G Tight-Corner Hinge. Offers unusual rigidity and strength, yet light in weight. Easily assembled. Nail holes pre-drilled. Made up in 3 parts. Shipped collapsed.

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Substantial Saving Achieved

Comparison of costs in the old versus new methods show the economy gained through pneumatic handling:

	Old System	New System
Labor unloading per ton . . .	\$ 2.14	\$.30
Transportation cost per ton . . .	7.00	5.64
Lime cost per ton . . .	15.50 (bag)	11.50 (bulk)
	\$24.64	\$17.44

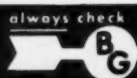
Savings: \$7.20 per ton.

Savings per year (241 tons): \$1,735.20.

Total cost including silo and pneumatic conveyor system was \$9,000.00. The system will pay for itself in about 5 years, running at 25 percent of capacity.

These figures do not include depreciation or a comparison of cost of handling the material from the silo or storage area into the water system.

FLOW thanks Lamson Corporation for pictures and data covering this installation.



Write for complete details and prices to...

BIGELOW-GARVEY
lumber company

General Office and Laboratory
326 W. HURON STREET • CHICAGO 10, ILLINOIS

Circle No. 19 on Reader Service Card for more information

HARD-TO-HANDLE MATERIALS

(Continued from page 72)

lime and an electric heating element which raises the temperature of the water to 140 degrees Fahrenheit to facilitate the slaking process.

Solves Dust Problem

During the design of the Nottingham plant much attention was given to handling activated carbon for controlling water odor and taste. Bulk handling was desired, but at that time no facilities were available for purchasing carbon in that form.

In anticipation of the severe dust problem of handling carbon, precautions were taken to simplify and mechanize handling in bags. The bags are unloaded from freight cars onto wooden pallets which hold approximately 40 bags each. The pallets are conveyed by hand operated electric lift trucks to the eight carbon storage rooms,

each with a capacity of 175 tons.

Each storage room has a fire alarm signal, carbon dioxide fire protection, smoke detectors and a thermocouple that automatically seals off the room and sounds an alarm so the operator can turn on the carbon dioxide.

The carbon feeding equipment occupies two floors and is isolated from the rest of the plant. Individual bags are fed manually into two carbon feed hoppers each with a capacity of 4300 pounds. As the bags are lifted in, they strike a metal cone which cuts them open.

Forced ventilation through cloth bag filters inside the hoppers prevents the spread of carbon dust. Empty bags are deposited into an opening inside each hopper that leads into a steel box. When the box is filled, it is closed, removed from the hopper and carted into an incinerator by means of a lift truck.

The carbon feed hoppers are located directly above two loss-in-weight dry chemical feeders, each with a capacity of 7.5 to 750

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LIGHTWEIGHT-ECONOMICAL

It's the Revolver® Portable Uplifter Elevator

Adaptable for shop use or warehouse handling and ideal for shipping and receiving—the new electric Uplifter is the real buy today in materials handling. In two capacities, 1000 - 2000 pounds, platform sizes 24 x 24 and 30 x 30, lifts of 62 and 65 inches on standard models—the Revolver Uplifter can be had powered by a variety of electric circuits ranging from an automobile battery to 220 volt currents.

Priced under all competition, the Uplifter includes all the safety and convenience features that have made Revolver portable elevators a standard in industry. Get full information today on this new, easy operating inexpensive portable elevator. Remember, too—we build Revolver Portable elevators to your particular needs.

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**780
SHAFT DRIVE
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extra POWER, extra CAPACITY, extra ECONOMY



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Brand NEW for 1954!

You get ALL the extra power advantages of large vehicle shaft drive PLUS the quick, easy handling of Cushman light hauling vehicles. Extra power is combined with automotive type transmission and clutch. Three speeds forward, one reverse.

780 Truckster gives you EXTRA CAPACITY—handles payloads up to 500 pounds! Nearly 10 cubic foot cap. box is complete with tailgate and stake holes for sideboards mounted on all welded body of extra heavy steel. Get extra power—extra capacity—for a total operating cost of $\frac{3}{4}$ ¢ per mile!

Try **CUSHMAN** in your own operation!

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HARD-TO-HANDLE MATERIALS

Continued

pounds an hour. Slurried carbon from the feeders is injected into raw water and/or the effluent conduit of the settling basins.

Hoists Used for Chlorine

Chlorine for removal of bacteria from the water is brought to the plant in trucks or flat cars in cylinders, each holding a ton

of chemical and weighing a total of 3800 pounds when full. The cylinders are lifted off by an electric monorail hoist, dropped from the monorail onto the platform and picked up again by another electric monorail hoist which transports the tanks to the storage and chlorine weighing rooms.

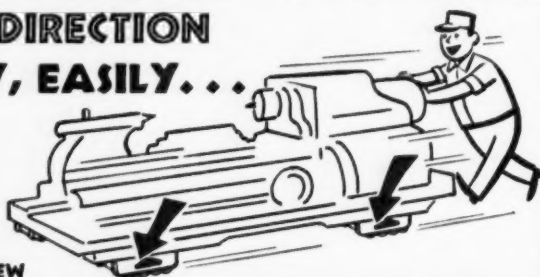
The chlorine-feed-machine room is adjacent to the dry chemical feeder room. It is equipped with three 4000-pound vacuum type chlorinators for pre-chlorination.

Each machine is equipped with operational alarms.

The chlorine weighing room is next to the chlorine feed room. Three platform dial scales, two of 12000 pounds capacity and one with a capacity of 8500 pounds, are equipped with recording mechanisms and warning alarms.

Chlorine solution from the feeders can be added to the suction of each raw water pump, to the raw water rising well, and the effluents of the settling basins and the effluents of the filters.

NOW YOU CAN MOVE HEAVY MACHINERY & EQUIPMENT IN ANY DIRECTION QUICKLY, EASILY...



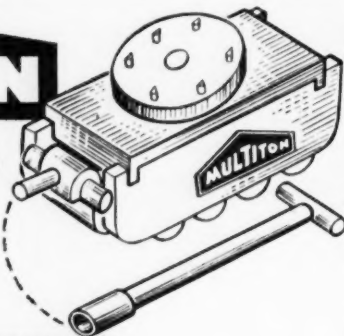
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UNIVERSAL SWIVEL PLATE-EQUIPPED

MULTITON

ROLLER SKID

Built like a tractor, MULTITON has a carrying capacity of 3200 times its own weight. Yet, it is compact, light and needs so little storing room. Multiton gives you savings in labor and handling.



HERE'S HOW MULTITON CAN WORK FOR YOU...

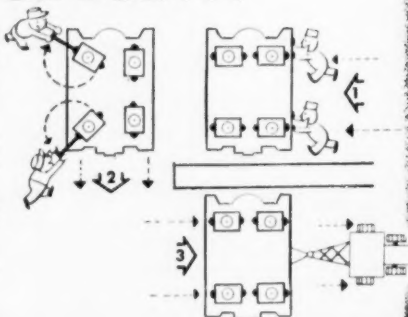
Machinery and other heavy loads can be carried and maneuvered into the tightest spots. You can make 90° turns, or ANY kind of turn easily up to 360°. As in this example...

1. Production machine is moved broadside out of location. Note position of four Universal Swivel Plate-Equipped MULTITON ROLLER SKIDS.

2. Crew is now swiveling two left-hand skids 90°, while right-hand skids have already been turned.

3. If a longer movement is necessary, power is used to pull load.

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Electrically Heated Screens

Separation of wet particles of different sizes is a problem in coke production plants, steel mill sintering of ores and the handling of clay in brick plants and potteries. Vibrating screens, electrically heated to prevent screen blinding by the wet material, provide a solution in these operations.

At a Cleveland steel plant, the problem is to separate coke into plus 1½-inch, ¾ to 1½, 3/16 to ¾ and minus 3/16-inch sizes. The coke is pushed from the ovens into the hot car of seven tons capacity. Each load of seven tons is quenched with 5000 gallons of water. It is conveyed by rubber belt to a 1½-inch screen, 4 feet wide and 10 feet long. The plus 1½-inch coke goes directly to the blast furnace receiving bins. The minus 1½-inch is conveyed to another screening station where the other sizes are separated. The ¾ to 1½-inch is also used in the blast furnaces, while the minus ¾-inch sizes are delivered to outside customers.

The second screen is 5 feet wide and 10 feet long and double decked. An electric current is carried to the top and bottom screening sections by means of bus bars and braided cables. The screens are of hard steel to resist abrasion.

A moderate amount of current is used, enough merely to heat the screen to a point where it will not retain moisture. The double-decked screen is tipped so that the coke travels down the incline.

The angle of incline is an important factor in determining the rate of flow. Also, if the screens are loaded to over-capacity, the fines congregate with the coarser material.

Vibration is provided by an eccentric on a shaft to give the screens a half-inch throw.

Safety for Product and Personnel

The problem of handling forging stock weighing between 400 to 500 pounds safely and so that the forging will not be marred was solved by Aluminum Co. of America through the use of a specially designed manipulator mounted on a truck. The truck, driven by electric current from a power line with the third wire in the floor, operates over a distance of 60 feet from the furnace to the die press. The manipulator is carried on a 15-foot boom, and the boom and manipulator jaws are controlled by the truck operator. By means of electrical controls the operator

opens and closes the jaws of the manipulator, raises and lowers the boom or moves it from side to side.

Recently, a diesel-electric truck has been put into use to handle ingots up to 10,000 lb. This unit is not limited to operation on fixed rails as are the older ones.

Approximately 80 holding furnaces for molten aluminum alloys are situated in three large bays at the Aluminum Company where hundreds of small castings are made each day with the use of permanent molds. At each molding station there are two holding furnaces.

The metal is carried in ladles from melting furnaces to the holding furnaces at an average distance of about 200 feet. The ladles are suspended from overhead tramrails. Each ladle is controlled by an operator who walks along the floor with it. When he presses the proper buttons the electric motor overhead moves the ladle along the tramrail line, raises or lowers it. A tramrail scale records



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The ease with which your equipment may be guided, and the smooth operation of the positive swivel, will continue over a long life of satisfactory service if you use Darnell Casters.

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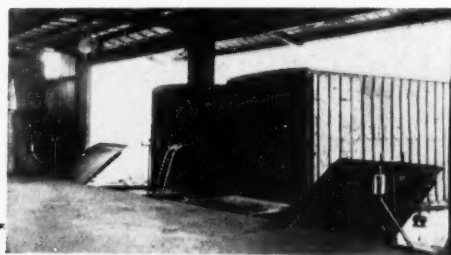
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131

DO YOU
LOSE YOUR
PROFITS
ON YOUR
DOCK?

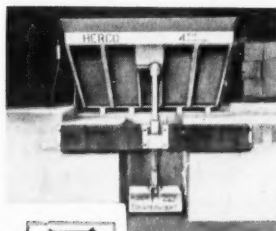


4 Herco dock installation at Novi Equipment Co.,
Novi, Michigan

You can lose money and profits just as easily in slow, wasteful handling on your dock as in your plant—and it's all part of your production costs.

STOP PROFIT LEAKS—CUT HANDLING COSTS with a

HERCO DOCKBOARD



Adjust up—down—left—right in seconds.
Positive lock in UP position; automatically follows carrier level in DOWN position.
Patented spring action counterbalance automatically adjusts weight to dock.
Economical to install in old or new docks.
No maintenance required; hardened gears give life-time service.

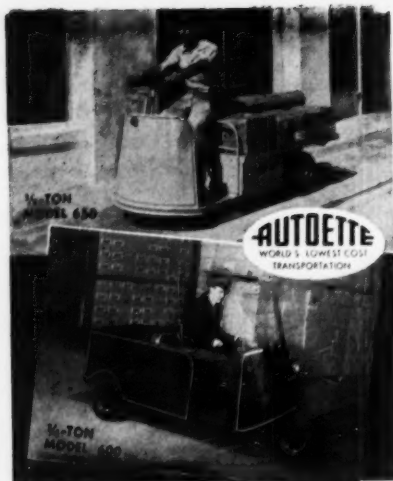
2 sizes—48" x 72" and 60" x 72";
20,000 and 30,000 lb. capacity
in both sizes.



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FLOW • JANUARY, 1954



2 great new **ELECTRIC** **AUTOETTE Pickup Trucks**

Electric AUTOETTE Pickup Trucks are ideal for all types of light hauling in industrial plants... docks and warehouses... resort hotels... movie lots... golf courses... estates and ranches.

Both the 1/4-ton and 1/2-ton AUTOETTE Pickups are sturdily built to give years of dependable, trouble-free service. Because there's no engine or complicated parts, AUTOETTES are free from costly repairs and adjustments.

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AUTOETTE Pickup Trucks are famous for their amazing economy. Only 3 cents for electricity for 12 hours of daily hauling—30 miles of travel. Less than a dollar a month—\$10.00 a year—1/5 cent per ton-mile!

At the end of the day, just plug the Taper Charger into any electric outlet. The batteries are charged overnight—ready for another day of perfect service.

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132



HARD-TO-HANDLE MATERIALS

Continued

the amount of alloy each operator delivers.

As many as 10 different alloys may be put into the different molds at one time. Each mold is tagged with a number to identify the alloy to be used in it so that the ladle operator knows which type of melted alloy to deliver to each holding furnace.

Tramlines Used for Ladles

The holding furnaces are arranged in numerous parallel lines across the width of the room. From the main tramrail lines the ladle carriers may be switched off to branches which parallel the holding furnace lines. Paralleling the ladle tramlines is another series of branch lines from which boxes are suspended to hold the finished castings. The suspended boxes are moved a short distance manually to a powered chain conveyor which moves them to the trimming and storage areas.

Molten iron is transformed into engine blocks, heads and other parts at a rate of 125 tons an hour at the Cleveland foundry of the Ford Motor Company. Transforming this metal into castings for 4500 engines a day is made possible by an elaborate system of conveyors.

In the foundry, which covers more than 1,000,000 square feet, there are 8 molding conveyor loops utilizing 66 molding machines.

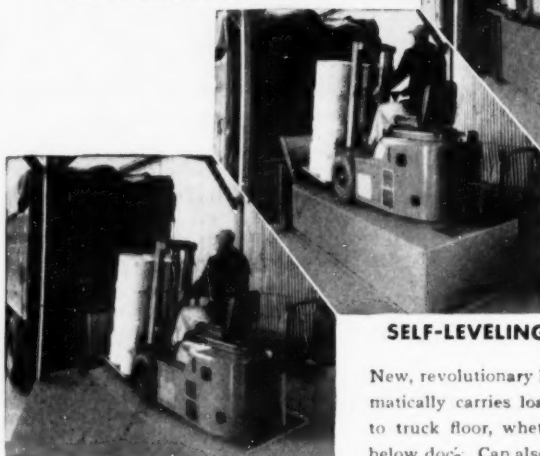
Five cupolas operate at one time. Hot metal flows continuously out of each cupola into an 8-ton ladle.

The metal is picked up by 2-ton transfer ladles suspended from an overhead track. Each ladle is controlled by an operator who rides in a cab directly behind it. The ladle and cab are suspended from a beam which, in turn, is suspended from the carriage on the overhead tracks.

The carriage contains the electric motors for propelling the ladles forward or backward and up

FULLY AUTOMATIC!

**A Loader with a
Mechanical Brain!**



SELF-STOPPING

SELF-LEVELING

SELF-STARTING

LOAD-O-MATIC*

* Pat. App. for

New, revolutionary loading platform automatically carries loads from loading dock to truck floor, whether truck is above or below dock. Can also be installed at ground level. Motion controlled by switch bar in platform and by self-leveling ramp. Human element eliminated! No hand switches!

Exact levels! Models 6000 to 20,000 lbs.
Write for descriptive literature.

FIELD ENGINEERING CO., 66 Foote Ave., Jamestown, N.Y.

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FLOW • JANUARY, 1954

or down. The operator rides up and down with the ladle.

The track, consisting of a series of loops which direct the ladles from the cupolas to the molding line, has a total length of more than 1200 feet. At the switching points there are safety locks to prevent the ladle operators from colliding with their loads. There are also signal lights for the same purpose.

Operator Rides with Ladles

The pouring ladles, electrically driven, are suspended from a tram-rail loop system at the pouring station. They have a capacity of $\frac{1}{2}$ and 1 ton. Three ladles are used for pouring. Each pouring station loop extends 60 feet along one end of the molding line. The operator controls the electrically operated tractor and hoist by push buttons to fill the molds in the flasks.

The flasks move continuously on a car-top conveyor. While filling the molds, the operator stands on a moving treadwalk. Movement of the ladle, treadwalk and flask is synchronized so that the metal may be poured into the mold in a continuous stream without spillage on either side of the sprue hole. The synchronization also saves the operator hundreds of steps.

After the mold is poured—under a ventilating hood—the flask makes a 180 degree turn to the back side of the molding line. The flask moves to the head removal station in the cooling tunnel where the wedge clamps holding the cope and drag together are removed.

At another opening in the cooling tunnel, a worker fastens a clamp resembling a giant ice tongs to the cope. Counterweighted at the top of the arms to hold it open when the load is released, the clamp is suspended from a pneumatic cylinder hoist. Traveling horizontally on a fixed monorail, the cope is moved over and onto a vibrating shakeout.

Hooks Hot Castings

The drags containing the hot

Clamp Speeds Small Parts Handling

A NEW ROLL-OVER CLAMP makes it possible to dump containers of small parts automatically, through hoppers, into two-wheel steel carts.

The device, mounted on a revolving carriage on an industrial truck, has a pair of forks to grasp the container as it is tipped 180 degrees for emptying. It was developed for the Stoner Manufacturing Company, Aurora, Ill., makers of vending machines and small arms ammunition, and is shown dumping a load of brass cartridge slugs weighing 2,500 pounds.

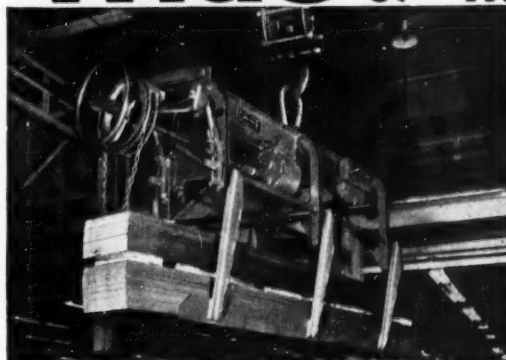
Stoner, which formerly emptied boxes by hand from an ordinary fork truck, has found the new technique both faster and safer.

The two-wheel cart is attached to a small tractor, which is used for hauling "cart trains" throughout the plant.

For more information on the roll-over clamp, write in No. 310 on the Reader Service Card.



Wide or Narrow...



**1 C-F
LIFTER
HANDLES
THEM ALL**

Whether your production requires a few or many widths of sheet steel, 1 C-F Lifter, with its wide range of jaw and carrying angle adjustments will probably meet all your sheet handling requirements.

Adjustments are made by the operator in a few seconds, permitting the Lifter to shift from wide to narrow sizes almost instantly.

Because it can pick up, carry and unload more loads per hour, using less man and crane time than any other method, a C-F Lifter will soon pay for itself.

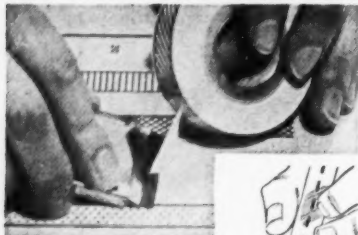
Bulletin SL-28 gives you the complete story of C-F Lifter advantages to you. Ask for it today. There's no obligation.



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HARD-TO-HANDLE MATERIALS

Continued

castings make another turn of 180 degrees to complete the molding line loop. At this point a chain conveyor on an overhead monorail dips from near the ceiling. Suspended from this conveyor are hooks at the ends of two short chains. A worker fastens the hooks on the castings, and the chain conveyor travels at low level for about 15 feet and rises. As it rises it pulls the castings from the drag. Smoke and fumes from the casting and hot sand escape through a vented hood.

The drag flasks continue to move on the car conveyor to the drag shakeout and then on a plat to the molding machine for refilling, while the castings move to the knockout house, where the cores are knocked out.

The chain conveyor is approximately 3,000 feet long and extends through the knockout house, through a cooling gallery and to the cleaning room. Each cylinder block casting rides on the chain

conveyor approximately $3\frac{1}{2}$ hours until it is cooled.

In chemical plants, steel mills and other operations where frequent chemical analysis is necessary for process control, the transportation of samples is often a major problem.

The Weirton Steel Company at Weirton, W. Va., overcame this through the installation of a pneumatic tube system. The tube line carries samples of benzol, toluol, xylol and other inflammables from the Benzol plant about a tenth of a mile to the by-products laboratory.

Pneumatic Lines Outside

As a safety precaution the terminal station of the pneumatic lines are out of doors. The steel tubing is shielded from the corrosive atmosphere by protective wrapping. The air pump is in the laboratory. A motor starter is in each station so that the air flow can be controlled at either end. A light and buzzer operate while the pump is running.

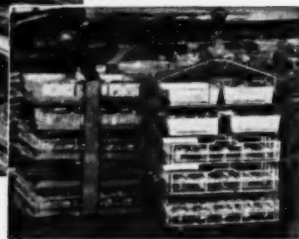
In operation around the clock, the line carries about 25 samples

Handling: Small Production Parts Bench to Bench Without Trucking



ALWAYS

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THE ALLIED 2-28 CONVEYOR

A traveling, stock conveyor that carries diversified small work parts to and from points of operations. It goes here and there smoothly, tucked away in small spaces; passes work benches at proper level for discharging and receiving

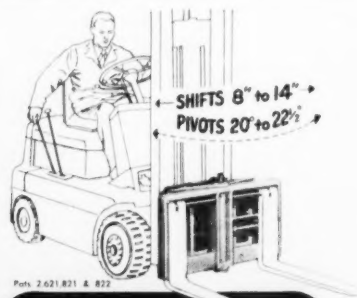
parts. It eliminates hand traveling and confusion of distributing parts to various, separated points of operation. The 2-28 is an interesting conveyor and it steps up production. Ask us about it for your plant.

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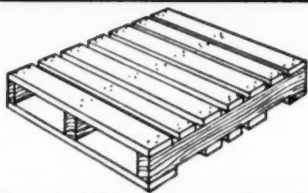
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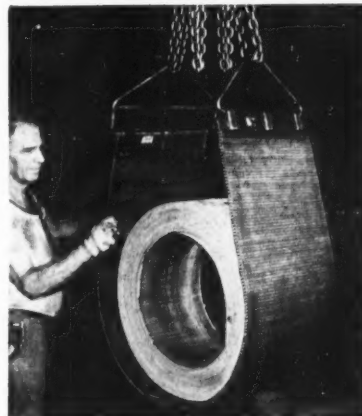
during an 8-hour shift. Vacuum propels the loaded carriers and air pressure the empties.

Made of fiber, 12½ inches long and 3½ inches in diameter, the carrier is constructed to hold a small bottle of liquid samples. On the outside, the carrier is reinforced with a steel cap. A thin rubber gasket and thick pad seal the cup. The pad also provides resistance to shock. On the top, a leather band provides reinforcement.

For photos and assistance in the preparation of this article, FLOW thanks the following firms:

Automatic Transportation Co.; Clark Equipment Co.; Cleveland Vibrator Co.; The Dow Chemical Co.; Elwell-Parker Electric Co.; Ford Motor Co.; General Electric Co.; Gifford-Wood Co.; The Grover Co.; Heppenstall Co.; Lewis-Shepard Products, Inc.; Link Belt Co.; Samuel Olson Mfg. Co., Inc.; Robins Conveyor Div.; Hewitt-Robins, Inc.; Standard Conveyor Co.; Stephens-Adamson Mfg. Co.; Tote Systems, Inc.; and United States Rubber Co.

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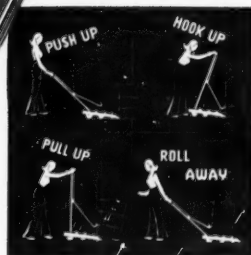
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THE
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TRUCK

"George" is a compact, strong roller truck designed to handle metal-loaded tote boxes easily. The handle, with attached hook, provides leverage to glide tote box over beveled edge of truck onto upper set of rollers. Load is safely held. A gentle pull easily gets truck under way to destination on lower set of rollers.

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FLOW • JANUARY, 1954

Storage System

Breaks Foundry Bottleneck

THE PROBLEM of storing a great variety of cores so that any type may be immediately available for use has been solved by The Symington-Gould Corporation of Depew, N. Y. With the installation of specially designed storage racks in its foundry, the firm has doubled available core storage space and made it easy to select any desired cores.

The design consists of racks—one, two or three decks high—designed to be handled by a high-lift platform truck. Each rack is also fitted with hooks for overhead crane handling.

The high-lift platform truck was selected because of the length of the loads handled. To handle loads of comparable length a fork-type truck would have to be much larger.

To conserve space in the core department of the foundry, and to provide maximum aisle widths, the stationary core rack supports were fixed at a 45-degree angle to the travel aisle.

Racked cores are now moved from the core department to the molding department by the platform trucks and then picked up and delivered to the molding units

by overhead cranes.

In the complete handling sequence the finished and dry cores are placed on the racks from tower or stationary floor-type core ovens. The racks are then trucked from oven areas and stored. Cores are segregated in designated core storage areas for easy and quick delivery to the foundry in mold sets.

The new handling technique solves one of the most common and troublesome problems in effective storage and handling in foundries. This is vital from the standpoint of breakage, the elimination of congestion, increased accessibility of stored cores, and overall effective foundry operations.

Such a problem becomes increasingly critical in foundries subject to changes in types of work from day to day and from month to month, where large quantities of cores must be kept on hand and ready for immediate use. A delay in locating cores for particular uses, as they are needed, often means costly tie-ups in foundry operations.

Photos and information courtesy of Elwell-Parker Electric Co.

PLATFORM TRUCK (below) transports three-deck core rack at Symington-Gould foundry. Rack is skid-mounted for truck handling and fitted with lifting hooks for overhead crane. In the core department (right) the three-decked rack is being elevated to a position on the upper tier of stationary core rack support.



SALES FIELD . . .

(Continued from page 30)

Sandvik Steel Belt Conveyors Div., of Sandvik Steel Inc. announces the opening of new sales offices at 230 N. Michigan Ave., Chicago, Ill. The office, under the direction of **Arve Larson**, is prepared to provide information and engineering assistance for various types of steel band conveyor users throughout the midwestern territory.

The appointment of **William E. Johnson** as sales manager of the New York City branch of the **Automatic Transportation Co.**, has been announced by **Foster W. Lamb**, general sales manager. Johnson assumes duties formerly held by **George A. Hinckley**, recently named a sales manager

for the company in Chicago. Johnson had been a sales representative for **Yale & Towne Mfg. Co.** until his transfer to **Automatic** in 1947.

The appointment of **McNall Machinery & Supply Corp.**, Cedar Rapids, Iowa, has been appointed a distributor by the **Baldwin-Lima-Hamilton Corp.** for its construction equipment division's line of Lima shovels, cranes, draglines and pull-shovels. The firm, located at 600 D Avenue, N.W., will service both central and eastern Iowa.

Hammerslag Equipment Co. of San Francisco has been appointed exclusive northern California distributor for **Mercury Mfg. Co.**, according to **O. T. Henkle Jr.**, executive vice president of Mercury. **Jay Platt Hammerslag Jr.** is owner and general manager of the distributor firm.

**For Faster, Easier
PALLET MOVING**

USE Weld-Bilt PALLET TYPE

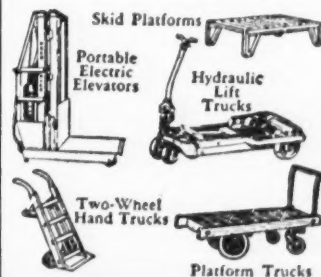
HYDRAULIC LIFT TRUCKS



You'll speed up and simplify pallet-moving of materials — with the "Weld-Bilt" Pallet Truck! It's built to handle a greater variety of single or double-faced pallets easier and faster. Easier on truckers, too.

Check the design and construction of the "Weld-Bilt" and you'll know why. The sturdy forks, with their greased-for-life ball bearing wheels are easier to handle and position under loads of 2,000, 4,000 lbs. and 6,000 lbs. Other features include: Multi-stroke hydraulic lift, accelerator type lowering pedal, "anti-kick-back" safety handle, front wheel equalizer, ball bearing wheels, and many others — all built for longer service, easier operation.

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Pallet Truck Bulletin 1149.



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MATERIALS HANDLING ENGINEERS

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Maximum capacity 5 cu. ft. 16 gauge tray, all-welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

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**Sterling
WHEELBARROWS**

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FLOW • JANUARY, 1954

FORK TRUCK SELECTION . . .

(Continued from page 66)

standardization will eliminate special situations that might arise where one truck would be able to maneuver in an area where another could not.

Standardization within the plant is of most interest to the fleet owner, who should standardize on one or two makes of trucks. Many companies use some of each type, as requirements demand. Obviously,

ly, the largest group of fork truck users, those with one to three trucks, will not be as concerned with standardization as the large fleet owner.

This majority group does not have as much to gain in terms of dollars and cents, but the effect of lost time due to fork truck failure, which could be a result of not standardizing, may do more harm percentage-wise than the same type of failure in a large concern. If a company had just two trucks, and they were differ-

ent, twice as many parts would have to be carried.

The user who is buying his first fork truck should consider the possibility of the future standardization. If there is such a possibility, the prospective truck should be examined with this in mind, so that units may be added without affecting standardization. For example, a user might be considering a 400-pound truck, but foresees the purchase of two larger units and one smaller unit in the future. In the interests of standardization, the user should buy the truck from a manufacturer who can furnish the other three.

Price. A true comparison of the cost of fork trucks can be made only after operating the trucks for several years. The determination of the price class of the equipment must be made before the trucks are purchased, however. The price of the original equipment appears to vary inversely with the operating and maintenance cost.

The difference between trucks manufactured by all companies can be determined only by a complete history of the different trucks. The operating cost can be determined, with a fair degree of accuracy, by a work sample test. The maintenance cost of one company's truck versus the other can be determined by experience only.

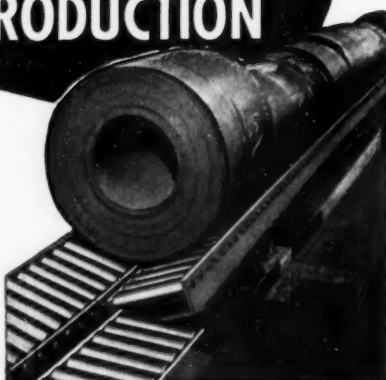
Whether a company buys a comparatively high cost truck with low maintenance and operating cost, or a low cost truck with comparatively high maintenance and operating cost, depends upon the financial position of the company. If a company is more interested in operating and maintenance costs, then these should be the main considerations in selecting trucks, relative to price.

If a company is primarily interested in the initial cost, as may be the case with a small company whose trucks operate a small percentage of the time, then first cost should be the main consideration.

The savings realized where a high cost truck with less operational cost is used must be com-

1954 TECHNIQUES THAT SPEED PRODUCTION

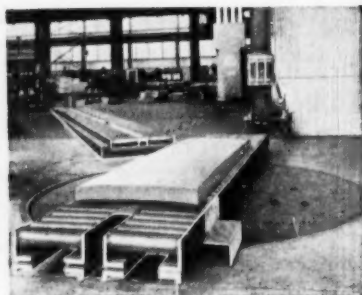
COILS OF STEEL—weighing as much as 30,000 pounds—are handled quickly in a large eastern steel mill on this A-F Engineered Completely Coordinated Conveying System. An A-F Tilter discharges coils automatically from conveyor. Many other features speed up work of stacking and distributing sheets.



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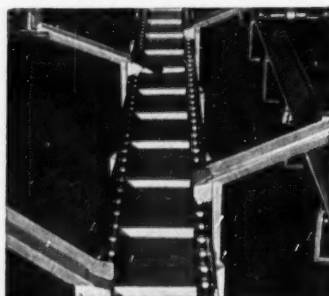
mounted on a powered turn-table distributes stacked sheet steel to the many work bays in this modern steel plant—easier and faster.

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pared to the savings of the additional capital if it were invested in another manner. In some cases, the manufacturer may receive higher earnings from the additional money by investing it in production equipment that is directly related to his business. However, the fork truck should be considered a production machine.

Maneuverability. An examination of the differences of mechanical specifications that affect maneuverability indicate that the same makes vary considerably in some factors, but insignificantly in most.

It is more difficult to differentiate one manufacturer's truck from another's according to maneuverability. The best way to determine this comparison, if history on trucks is not available, is to run an actual job sample of work and compare the trucks as to the actual amount of work accomplished and the cost per unit of material moved.

An examination of the different inch-pound ratings for the fork

trucks that were surveyed shows that they vary from 144,000 inch-pounds to 160,000 inch-pounds, with the average being 153,000 inch-pounds. The difference from the lowest to the highest is approximately 10 percent.

The weight of the truck is a factor which is usually given in specifications. Fork trucks have a high tare load for the capacity load that is carried, due to the cantilever principle of construction. As a general rule, the differences in weight for the same motive-powered trucks made by different manufacturers is not sufficient to be a valuable consideration. However, the weight difference of fork trucks would be an important factor when the floor limits of the building, trucks or railroad cars in which the fork trucks are used are low.

Mast tilt is a factor that can be important in handling operations involving the removal of pallet loads from railroad cars when the truck is on a ramp. The tilt may not be sufficient to bring the

forks into a horizontal position so they may be inserted in the pallet.

Mast tilts on the various trucks range from 2 degrees to 6.5 degrees forward, and from 10 degrees to 15 degrees backward. If some special tilt features are required, the difference in forward tilt might be a determining factor. A difference of one degree in mast tilt results in a difference of six-tenths of an inch at the tip of the forks, depending on the location of the mast center pin. It is possible to obtain 2.7 inches more adjustment on the tips of the forks in forward tilt and 3 inches in backward tilt by selective buying.

Lift heights can be varied on almost all trucks. Most masts on the 4000-pound trucks have a maximum lift of between 120 and 130 inches. If the user can utilize the standard mast, he will save on the purchase price. Many users are now standardizing on 68-inch high masts, for use in highway trucks

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Here are Some of the others:—

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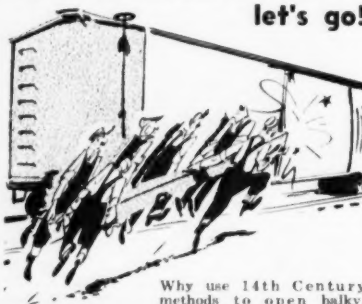
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Come on boxcar door...
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THE NOLAN ONE-MAN CAR DOOR OPENER OPENS ANY BOXCAR DOOR IN 20 SECONDS OR LESS!

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FORK TRUCK SELECTION

Continued

and trailers.

The ability to travel on level surfaces can be determined by a comparison of underclearance, whether a truck has 3 or 4-point suspension, wheel size, and height of bed. Underclearance is important where floors are rough and projections rise up from the level part of the floor, and this dimension varies from 2½ inches to 7¼ inches.

The height of the bed determines a truck's ability to clear ramps and large variations in the floor surface, and this dimension varies from 4 inches to 7 inches. To determine if a truck will clear a ramp is a matter of geometry for the most part, since many manufacturers do not include these specifications.

Wheel sizes vary from 9 to 16¼ inches in diameter by 5-inch width for trail wheels, and from 15 to 22 inches in diameter by 7-inch width for drive wheels. Larger wheels will negotiate rough floors better, and, if floor conditions are severe, pneumatic tires should be used.

The real determining factor in fork truck selection should be the time required and the cost to handle a load. This does not necessarily mean that the fastest truck is the one with the most forward speed.

The best way to determine the maneuverability and operational characteristics of different trucks, if no past history is available, is to use a work sample test. The results of such a work sample, conducted by a manufacturer to determine which of two trucks would be better suited for a customer's particular job, appear on page .

The comparison of each detailed specification cannot be used to select or evaluate complex equipment unless only one or two units are being compared. Selection of any equipment should be made only after a review of all models of all manufacturers. However, to review 27 different fork trucks, specification by specification, would require a great deal of time. Furthermore, even if this were

done, a true picture would not be obtained because the importance of each detailed specification cannot be evaluated.

Thus, the advantages of adopting the selection procedure which incorporates the five overall selection factors just discussed become apparent. The selection of one or two trucks from a large group can be made with ease when comparing only five factors, even when 27 trucks are being considered. For example, the data may look like this for the top three trucks in each factor:

Factors	Truck Ranking (First 3 only)		
a. Motive Power	1	14	4
b. Price	14	1	6
c. Service	1	8	14
d. Standardization	1	14	7
e. Maneuverability	14	1	15

According to this check, Company "1" would be favored, since it placed first in three factors and second in the other two. Special features may be used to determine selection if several fork trucks compare equally. As a general rule, the factors will be greatly simplified after the trucks have been ranked.

MEN IN THE NEWS . . .

(Continued from page 20)

... at Hercules Motors Corp.

At a recent meeting of the company's board of directors, **John C. Keplinger** was elected president. He has been with Hercules since 1926 when he joined the firm as sales manager. In 1931 he was named vice president in charge of sales and elected executive vice president in 1948. Other appointments include **Lawrence G. Downey**, vice president; **George W. LaSalle**, vice president; **F. H. Geisler**, director of sales, and **Dr. E. A. V. Horiak**, chief engineer.

... at Alvey Conveyor Mfg Co.

The appointment of **Calvin A. Burton** to the position of general sales manager has been announced by **John M. Alvey**, president. Burton has been as-

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Eight Ways WRIGHT-HIBBARD FORK LIFT TRUCKS Can Save You Money!

1. LOWER INITIAL COST
2. MORE ECONOMICAL OPERATION
3. PROVEN DEPENDABILITY
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Low Lift Platform Trucks
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IN OVER 1500
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Write for Our Catalog.
It contains information on portable conveyors up to 35 feet. Light duty conveyors, stationary and infra-floor units in various belt widths and lengths.
Dealer inquiries invited. Sell this popular line.

CHANTLAND MFG. CO.
BADGER, IOWA U.S.A.

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MEN IN THE NEWS

Continued

sociated with the conveyor industry for 30 years in engineering, sales and executive capacities.

... at Lamson Mobilift Corp.

Following the recent acquisition of the Mobilift Corp. by Lamson Corp. officers have been appointed to head the new Lamson subsidiary. **Hiller G. Boutin** is president. **Samuel Weiss**, vice president, and **F. D. Weeks**, vice president. Weeks also serves as vice president of Lamson Corp.

... at Heppenstall Co.

In the November issue of FLOW **Edward D. Fagan** was erroneously listed as sales manager. Instead, his appointment as sales engineer for material handling equipment was being announced. **Ward Duchene** is the sales manager.

... at Baker-Raulang Co.

Two important executive appointments have been announced by board chairman **William A. Bauer**. **John A. Matousek**, formerly vice president of manufacturing, has been named vice president and general manager. **Ernest R. Scovil**, formerly secretary of the company, has been named secretary and treasurer.

... at TelAutograph Corp.

Announcement of the election of **George M. Szabad** as president was made recently following the resignation of **R. L. Spotts**, who formerly held the post. Szabad is a member of the New York law firm of Blum & Jolles and has acted as legal and financial counsel to TelAutograph. He



formerly has held government posts in the Labor and State departments.

... at Hewitt-Robins, Inc.

Austin Goodyear, general manager of the rubber and conveyors divisions, has been elected a vice president of the company. He joined the company in 1941 and was named production manager of the Pas-saic, N. J., plant six years later. In 1952 he was named general manager of the conveyors division and the rubber division, and soon after was made a director of the firm.

F. D.

is here !!!

(See page 57)

5 FEATURES that make load-lifting

with a **marforge** EASIER

- ① **LIFTING ACTION** requires only 30-lbs effort, while standing erect . . . no bending . . . no crouching
- ② **STEERING** made easier by double ball-bearing 5th wheel (5" dia.)
- ③ **LOWERING SPEED** controlled, protecting fragile loads
- ④ **MANEUVERABLE** wherever a man can stand — Does not block aisles when lifting
- ⑤ **PULLS EASIER** because of sealed ball-bearings in each wheel, and large diameter (10") front wheels



**1953 SKID
LOAD LIFT**

Capacities up to 10,000 pounds

Widths — 18" and 24" Lengths — 24" to 72"
For 6 1/2", 7 1/2", 9 1/2", 11 1/2" Skid Platforms
Standard Lift 3". Special Lifts to 8".

**WRITE FOR
FREE TRIAL OFFER.**

56 Years In The Materials
Handling Business

Circle No. 94 on Reader Service Card for more information

Market Forge Company
EVERETT 49, MASSACHUSETTS

**TWO MEN FOR THE
PRICE OF ONE WITH**

**MICRO
LEVER-DOLLIES**

Usually Purchased
and Used in Pairs.

Reasonable in
Price and
Guaranteed



Made in
3 Handy
Sizes

**FINEST
MATERIALS
AND
WORKMANSHIP**

Write for complete
descriptive circular

MICRON, INC., Dept. F
BETTENDORF, IOWA

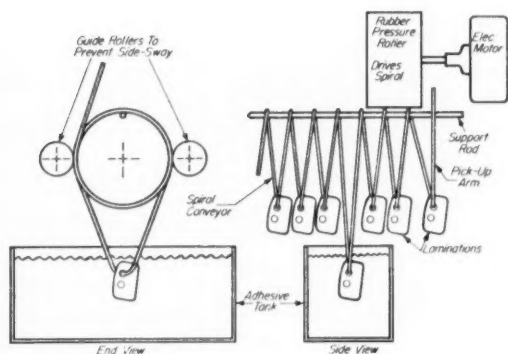
Circle No. 99 on Reader Service Card
FLOW • JANUARY, 1954

If you put small parts through coating or dipping steps, see this source of substantial savings in a . . .

"Spiral Spring" Handling System

First Prize Winner in Wunsch Foundation Awards, sponsored by Silent Hoist & Crane Co., at Illinois Institute of Technology, this paper by Henry H. Kulier features design of unique conveyor that eliminates manual handling of small parts.

NO ATTENTION IS REQUIRED for a system proposed to handle small parts through dipping and drying operations. Although it is intended to be applied in coating and drying laminations, the method is suitable for acid cleaning baths, neutralizers, cleaning, painting, plating, baking, and the like.



The heart of the new system is a horizontal spiral conveyor, essentially a length of wire formed into a spiral like a coil spring. If the spiral is placed over a support rod and rotated, it can continuously convey objects suspended from it. If all of the spirals are of the same diameter, the objects will travel in a horizontal direction. But if one of the spirals is larger in diameter, the object will dip down when it travels on the larger loop so that it can go into a container or tank. Several dipping operations can readily be incorporated into the equipment simply by constructing more spirals of larger diameter, spaced at whatever intervals might be desired. After dipping, objects can be conveyed past heating elements or to further operations.

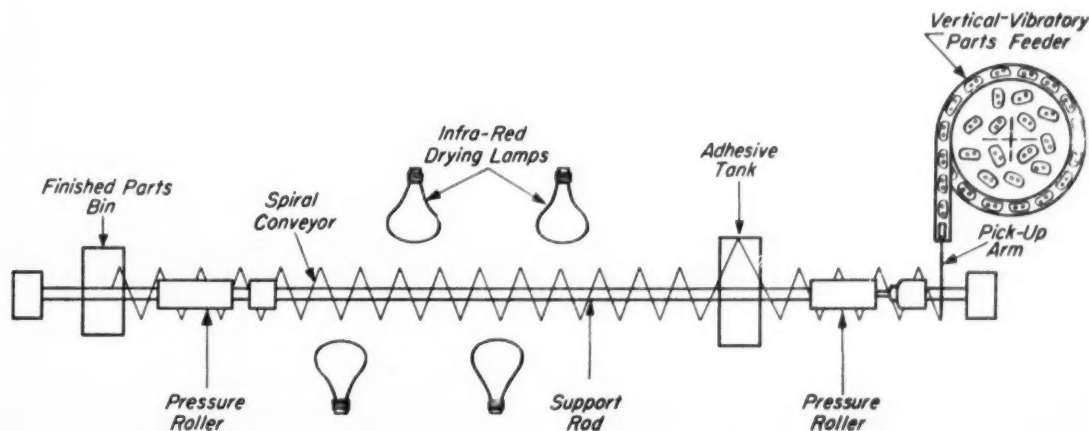
Drive for the spiral is provided by a pressure roller powered by an electric motor. If one roller is insufficient, additional ones can be positioned anywhere along the length of the spiral except where a larger diameter exists.

Parts can be fed into the conveyor by a vertical vibratory parts feeder, and since they are discharged automatically after travel, an operator is required only for the brief loading step.

Savings possible with the new conveyor are illustrated with reference to a specific application. Small laminations required in the manufacture of an electromagnetic device are held together by an adhesive

(Continued on page 159)

LEFT: Sketch for spiral shows how laminations can be carried. **PARTS WITHOUT HOLES** could be hung on hooks. **BELOW:** System for complete production cycle of small parts. Variations can be made almost at will.



Make every crane a scale...



Capacity
up to
200,000 lbs.

**RUGGED
EASY TO INSTALL
ACCURATE • ECONOMICAL**

Eliminates guess work
— Shows the reach of the boom, which is very important in making blind lifts and shows how much should be lifted at any boom position — Permits tallying lifts when loading trucks, thus preventing fines — Easily adapted to weighing bulk materials lifted in a clam shell bucket.

with the new

MARTIN-DECKER

TYPE SB-10

CRANE WEIGHT and RADIUS CAPACITY INDICATOR

A new principle of operation makes Martin-Decker Crane Weight Indicators easy to install, accurate and dependable. Attached to Boom Cranes, Bridge Cranes and Overhead Hoists, they are dependable, sensitive—yet rugged—weight measuring devices.

The remote indicating system permits easy and quick readability for the operator. Guaranteed accuracy of 1% of the maximum dial reading.

Martin-Decker Weight Indicators are used all over the world in Navy Yards, shipyards and industrial plants on all types of cranes. Many of these weight indicators have been in use for over 10 years.

For Operations Where Radius Capacity Indication Isn't Needed You'll Want The Lower Priced 200,000 lb. Capacity

MARTIN-DECKER

Type S-12 Remote Indicating CRANE WEIGHT INDICATOR

DISTRIBUTORS:

Detroit
George Meeks
Metal Products Co.,
6432 Cass Ave.

Philadelphia
Industrial Equipment, Inc.
1202-22 Frankford Ave.

Pittsburg, Calif.
Hirner Supply Co.,
6545 Hamilton Ave.,

New Haven
C. E. Reutter Corp.
P. O. Box 2922,
Westville Station

Malden, Mass.
Brodie Industrial Trucks, Inc.
50 Commercial St.

write for descriptive literature

MARTIN DECKER CORP.
LONG BEACH, CALIFORNIA

Circle No. 89 on Reader Service Card for more information

144

NEW EQUIPMENT

(Continued from page 40)

Sweeper with Catalytic Exhaust Attachment

Optional equipment now on all motorized Parker industrial sweepers (product of Parker Sweeper Co.) is a catalytic exhaust attachment produced by Oxy-Catalyst, Inc. It is said to have shown, in laboratory tests, complete removal of carbon monoxide from the exhaust engines used on the firm's sweepers. The attachment



can be seen in the accompanying illustration as a box-like contrivance located where the muffler usually is found on light gasoline engines. With this equipment, the firm says, it is possible to have the proven efficiency of motorized sweeping on large floor areas as well as complete freedom from noxious fumes. Mechanical sweeping, it is pointed out, is 400 percent more efficient than pushbroom work, in that it provides a means to better and safer working conditions that will more than pay for itself.

Circle 175 on Reader Service Card for more information

Tire-Mounted Cranes

Two additions to the line of Lorain Moto-Cranes produced by The Thew Shovel Co. are: Model MC-254W in the "TL" Series, with lifting capacity of 17½

tons; and model MC-424 of 22½ ton capacity (illustrated). Model MC-254W is a 3-axle unit available as a ¾ yard shovel, crane, dragline, clamshell, hoe or 1¼ cubic yard scoop shovel. Overall width of 106 inches is said to give additional lifting capacity "on rubber" without setting outriggers. Maximum boom length with tip extension is 95 feet. It is equipped with 8 forward speeds, (to 37 M.P.H.) 2 reverse, and air brakes. Power may be diesel or gasoline for turntable and carrier, with front driving axle, third drum and other accessories.



Model MC-424 is a 2-engine machine with gasoline powered turntable or superstructure mounted on a 3-axle carrier, with drive on the two rear axles, powered by a separate gas engine at 10 forward speeds (to 27 M.P.H.) and

FLOW • JANUARY, 1954

2 reverse speeds. The carrier has an overall width of 96 inches and air brakes. Maximum boom length with tip extension is 125 ft. The machine may be equipped with diesel power for turntable, third drum, power load lowering, front wheel brakes and other accessories. It is convertible to shovel, crane, clamshell, dragline or hoe booms.

Circle 176 on Reader Service Card for more information

High Lift Platform Truck

Known as the TRC series, a redesigned high lift platform truck of the stand-up rider type has been released by the Wright-Hibbard Industrial Electric Truck Co. It will be available in 2,000, 3,000 and 4,000 pound capacities, in a variety of platform sizes to handle different types of loads, in single lift and telescoping models. The most significant improvement is the hydraulically operated lift mechanism powered by a separate electric motor which permits the operator to raise or lower his load while the truck is in



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Confused?



... about CASTERS?

Let Hamilton, with over half a century of manufacturing know-how, help you make the right selection. Whether it's our famous Air-Flo Caster shown below, or one of the more than 200 types and sizes in the Hamilton line... chances are there's a Hamilton caster specifically designed to meet your exact requirements—each job-engineered and job-rated to provide years of trouble-free service.

Get acquainted with the Hamilton line! Write today for your free copy of the Hamilton Caster Catalog, and the name of your nearest Hamilton representative.

**THE HAMILTON
CASTER AND MFG. CO.**
1672 DIXIE HIGHWAY
HAMILTON, OHIO

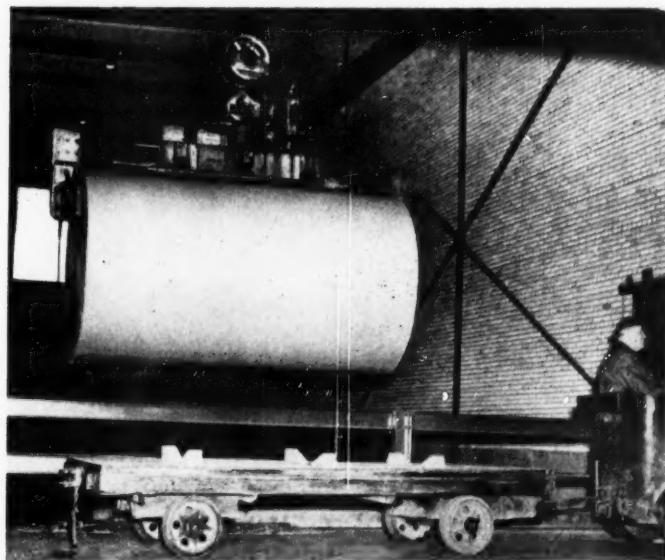


MANSAVER GRABS®

LIFT LARGE, ECONOMICAL LOADS

Longer continuous runs give economy in operation. Here a 10,000-pound roll of paper about 115 inches long is on its way

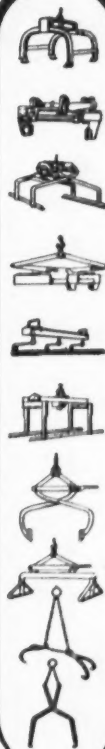
to the production line. But in spite of the large capacity of this Mansaver Grab, notice how little headroom it requires.



In this plant crane and trucks co-operate. In others the crane alone, equipped with the proper Mansaver Grab, does the entire job—from receiving to storage and storage to production. Mansavers can handle products in every industry, with safety and savings. Let us tell you how they can help you.

CATALOG SENT ON REQUEST

Our illustrated catalog shows many styles of Mansaver Grabs, action photos of Grabs at work in many industries, and some unusual applications. We shall be glad to send you a copy, without obligation.



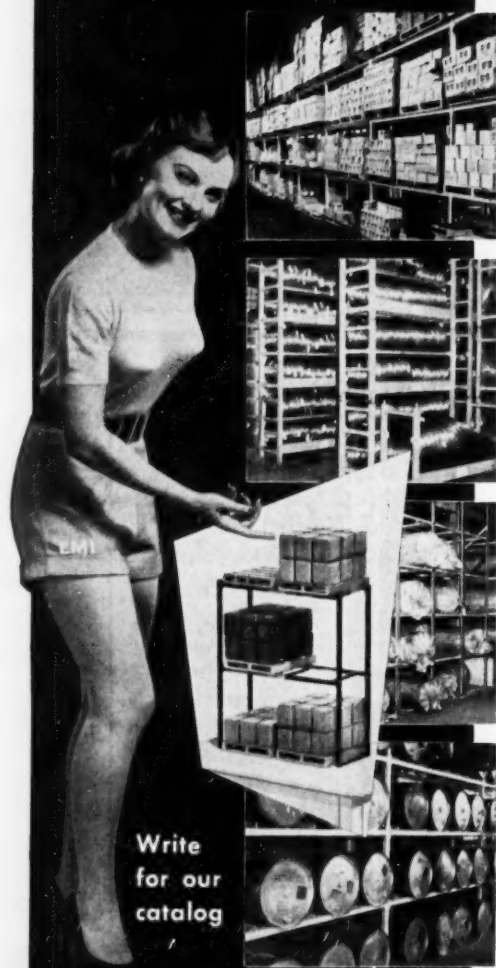
★ **MANSAVER INDUSTRIES, INC.** 3103 EAST ST., NEW HAVEN, CONN. ★

Circle No. 92 on Reader Service Card for more information

Well Stacked!

That's for sure—if it's stacked on strong square tubular EMI racks. They are designed not only to save floor space through claiming of "air rights," but to do it as efficiently as possible. EMI designs provide for safe, easy stacking and assembly.

Let our rack specialists assist you in planning your new system to incorporate the economies of unit load handling in production and storage, regardless of the type material or products involved.



Write
for our
catalog

**EQUIPMENT
MFG. INC.**

EMI

21552 HOOVER ROAD, DETROIT 5, MICHIGAN

NEW EQUIPMENT

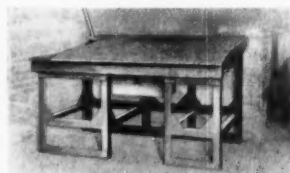
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motion. Speed of lift and operator's visibility are said to be very high. A magnetic controller provides four running speeds in either direction, and a time delay switch makes it impossible to jerk the load by starting in high gear. Other features claimed are compactness, maneuverability, and light weight.

Circle 177 on Reader Service Card for more information

Dock Board Stand

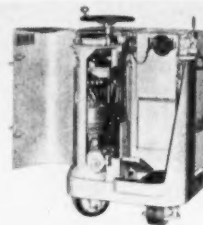
A self-supporting stand for firms using rented or old buildings, or those with limited dock space or unusual loading conditions, is offered by Karl A. Herman Co. to go with the firm's Herco Dock Boards. Installed in front of the present dock—to which it can be welded, or lagged into concrete or wood—the stand provides an expanded handling area by putting the loading dock completely outside, while retaining the flexibility and strength of the loading dock. Since it does not become a part of the building, the entire stand and dock can be moved when necessary. When the Herco Dock is bought with the new stand, it is shipped as a complete unit. For those who wish to obtain only the dock, and build their own stand, the Herman Co. will supply detailed blueprints of the latter, showing dimensions and the entire construction.



Circle 178 on Reader Service Card for more information

Power Unit Saves Servicing Time

All moving parts on the new power unit now being furnished by The Raymond Corp. are housed behind hinged double doors. There is nothing except the wheels to inspect or service under the unit, which is designed to save time in servicing. The complete turret drive assembly, for example, is said to be exchangeable in 30 minutes. All brushes on the unit are visible for fast inspection and replacement; control switches, contactors and lubrication points are likewise located for quick servicing. There is more room for the operator—the addition of a foot extension supplies extra space for the operator's feet, while leg guards are padded with sponge rubber for his comfort. The new unit is also said to be safer to operate because the steering wheel and controls operate entirely within the confines of the unit. There are



three speeds in both forward and reverse. The elevating control is located on the travel switch to enable forks to be raised en route. A manual lowering valve provides control over the speed of descent. Press-on tires of the drive wheel are a new type said to permit higher load capacity combined with good wearing qualities and less floor wear. The unit is built for ruggedness, with plate steel of 1/2 in. for the dash panel and leg guard, 3/16 in. for doors and covers, and 1/2 in. for the bumper. The battery slides in and out on built-in rollers for fast exchange.

Circle 179 on Reader Service Card for more information

Steel Floor Covering

For use where plant floors are subjected to heavy traffic, Armco Stelcon Anchor Steel floor plates are intended to reduce maintenance and provide greater safety, while keeping production going.

Plates are 12 inch squares of 11 gauge steel. Each has 53 projections to anchor it securely to the concrete base and provide a strong steel surface that resists damage and wear. Plates are easily installed in new or old floors, says the manufacturer, Armco Drainage & Metal Products, Inc.

Circle 180 on Reader Service Card for more information

Shuttle Dumper

Designed for short and medium hauls over rough ground, the "Shuttle" Dumper illustrated is a heavy-duty equipment produced by Aveling-Barford Ltd. in England. It has patented two-way steering and four speeds—both forward and reverse—for "no turn"

work. Dual hand wheels are on a vertical steering column about which the driver's seat and foot controls turn so that he always faces the direction of travel. Tipping is by gravity or power assisted, said to insure positive discharge of sticky loads even when the dumper faces uphill. Of 4 1/2 yard capacity, the equipment is diesel powered, has low center of gravity and wide pneumatic tires for high stability. A differential lock, operated from the driver's seat, provides added traction where needed.

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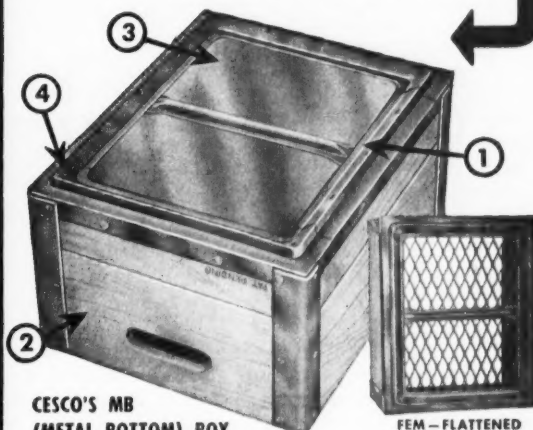
Cesco's TOTE-SHOP BOXES

...Do Your Job • EFFICIENTLY • EASILY • ECONOMICALLY

ON CONVEYORS, PALLETS, HAND TRUCKS, SKID PLATFORMS, OR WHAT HAVE YOU



1. Heavy Duty Strut . . . Prevents Sag . . . Permits Bottom Flex . . . Distributes shock.
2. High Grade Hard Wood Lumber .
3. (FM) Flat Metal Bottom . . . likewise available in open type bottoms FEM-FPM-WM illustrated below.
4. Specially designed "Bottom Stacking Runner" . . . One piece . . . Rounded Corners (No Mitered Joints — No Distortion).



CESCO'S MB (METAL BOTTOM) BOX

(Prices net - per box)	MB-20	MB-24
Lots of 2000.....	\$2.65	\$3.00
1000 — 1999.....	2.68	3.03
500 — 999.....	2.71	3.06
250 — 499.....	2.76	3.11
100 — 249.....	2.81	3.16

2 STANDARD SIZES

MB-20: 14 1/2" x 11 3/4" x 9 3/4"

MB-24: 17 1/2" x 11 3/4" x 9 3/4"

F. O. B. Northampton, Mass.

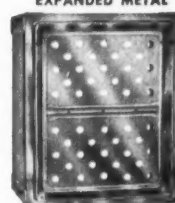
CESCO'S WB (WOOD BOTTOM) BOX

Depending upon the material packed and the handling method stock sizes will accommodate loads up to 200 lbs.; possibly greater.

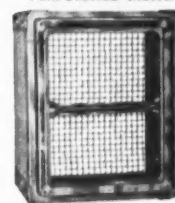
- Ruggedly constructed . . . steel reinforcing features of zinc coated prime stock . . . Self Stacking . . . convenient hand holes
- Binding rivets PLUS corner lock style yields maximum rigidity

Write today for quotations on special sizes . . . Please submit specifications.

FEM — FLATTENED EXPANDED METAL



FPM — FLAT PERFORATED METAL



WM — WIRE MESH

CESCO'S WB (WOOD BOTTOM) BOX

(Prices Net - per box)	WB-1	WB-2	WB-3
Lots of 2000	\$1.96	\$2.14	\$2.28
1000—1999	1.99	2.17	2.31
500—999	2.02	2.20	2.34
250—499	2.07	2.25	2.39
100—249	2.12	2.30	2.44

No. 1 size — (I.D.) — 14 1/2" x 11 3/4" x 9"

No. 2 size — (I.D.) — 18" x 11 3/4" x 9"

No. 3 size — (I.D.) — 20" x 11 3/4" x 9"

F. O. B. Northampton, Mass.

● Wire Baskets ● Special Pallets ● Tote Trays

CESCO CONTAINER CO.

475 Fifth Avenue
New York 17, N. Y.
Factory: Northampton, Mass.

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NEW EQUIPMENT

Continued

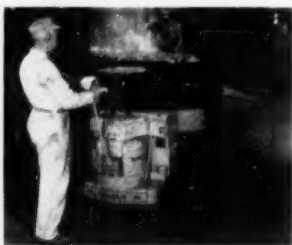
Narrow Belt Conveyor

Intended for handling small dimension, light weight containers, a narrow belt, "unitized" conveyor is offered particularly for such industries as the pharmaceutical, cosmetic, aerosol packaging, drug and chemical, plastics, food products and baking. Produced by Island Equipment Corp., it is constructed of standard parts and available with a 5 in. frame (taking 1, 2 or 3 in. belts) or 8 in. frame (for belts of 4, 5 or 6 in. width). It may be had in any length of 5 ft. increments, starting at five feet.

Circle 182 on Reader Service Card for more information

Underwriter Approved Trucks

Three of their driver-led trucks, reports Automatic Transportation Co., have been approved by Underwriters' Laboratories, Inc., for material handling in "semi-hazardous" operations involving unusual fire risks. They are the Transporter, Transtacker and Transtractor. (The Transporter is illustrated in operation in a paint

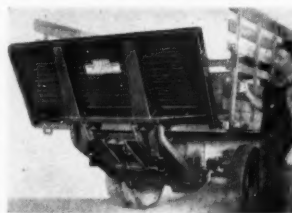


spraying department.) The approval means these trucks meet requirements that Underwriters' Labs. prescribe for Type "EE" classification, which has been adopted by the National Fire Protection Association for such handling operations. All models bearing the Type "EE" designation will carry an Underwriters' label and serial number as well as Automatic's own serial number.

Circle 183 on Reader Service Card for more information

Hydraulic Truck Tailgate

For lifting a maximum load of 2,000 pounds, the new Heil loader elevating tailgate, an all hydraulic unit, can be mounted on any truck, according to The Heil Co., its manufacturer. Two platforms are available for the unit—a ramp type, and platform or square edge type. The gate floor is corrugated for greater load capacity and to prevent floor sag. The hydraulic mechanism is mounted to clear the axle housing with no loss of ground clearance. Power take-off on the truck mechanism provides the hydraulic pump with power. When the gate is operated on a semi-trailer uncoupled from the



**NO RAMMING OR JAMMING! NO SPINNING OF WHEELS
WHEN LOADING BULKY OR "PACKED" MATERIALS**

LESSMANN
LOADALL

**DIGS IN WHILE
STANDING STILL!**

A HIGHLY MANEUVERABLE POWER SHOVEL

Lessmann LOADALL scoops up big loads of the most heavily compacted soils, cinders, aggregate, etc. . . does it in 5 seconds while standing still! Extra hydraulic cylinders supply Hydraulic Power Crowd. This means loading with hydraulics which eliminates ramming and spinning of wheels . . . minimizes repairs, reduces maintenance! Dozer blade is easily attached for grading, backfilling. Crane-hook, lift forks, snow and trash buckets are also available.

9 FT. DUMPING CLEARANCE

LOADALL has clearance for the highest trucks, bins and mixing hoppers. It loads or unloads at any height from 12" below wheel level to 108" above. Wheelbase of 73" and 12' turning radius make it highly maneuverable.

52" REACH

Here's a full 4'4" reach at maximum clearance! LOADALL carries load close but quickly boosts it 'way out ahead for easier loading . . . another advantage of Hydraulic Power Crowd.



Check these Features!

- ✓ **STANDARDIZED PARTS.** Ford, Timken, Vickers, Bendix, etc., assure highest quality components and low-cost servicing.
- ✓ **SAFETY.** Operator has unrestricted visibility and is protected from loader arms.
- ✓ **EASY HANDLING.** Full reverse shifting gives LOADALL four speeds forward and four reverse. Three simple, conveniently located hydraulic controls assure efficiency.
- ✓ **LOW COST.** You save on first cost, operating costs and maintenance costs with a LOADALL.
- ✓ **LOADALL BUCKETS.** Available with capacities of $\frac{3}{8}$, $\frac{3}{4}$, 1, 1 $\frac{1}{4}$ and 1 $\frac{1}{2}$ yards.



LESSMANN MANUFACTURING COMPANY

Affiliate of United Steel Barrel Co., Philadelphia—Wilmington, Del.

2003 Easton Blvd., Des Moines 4, Iowa

Write for Complete Information TODAY!

Circle No. 85 on Reader Service Card for more information

tractor, an electric motor or gasoline power pack can be used. The gate can be opened and lowered manually without starting the truck engine; a single control lever on each side of the truck body keeps the operator out of traffic during raising or lowering. A built-in neutralizer instantly stops the mechanism when the hand lever is released, and a safety by-pass valve protects the mechanism against overloading.

Circle 184 on Reader Service Card for more information

Truck Load Lifter

A new electric truck with pushbutton controls to help workmen move loads up to 1000 pounds from one elevation to another is manufactured by the Economy Engineering Company. Battery operated, the truck has a lift of 5 feet, an overall height of 6 feet 6 inches, a base frame of 24 by 39 inches, and a platform 24 inches wide and 39 inches long. The base wheels are two 8-inch solid rubber swivel casters and two 5-inch solid rubber fixed wheels, all equipped with roller bearings. The machine has a foot-operated floor lock. The hoist is an electric-hydraulic, gear operated pump, giving constant flow to the ram. The up and down pushbuttons are mounted on a 12-foot cord, held by a take-up cable reel for control from a location most convenient to the operator.

Circle 185 on Reader Service Card for more information

INCREASE EFFICIENCY ON YOUR LOADING DOCK WITH SENSATIONAL NEW

ROLLWAY

PORTABLE STEEL DOCK PLATE

(Patent Applied For)

One Man Can Move the ROLLWAY Heavy Steel Dock Plate Easily and Quickly!

The specially designed handles and wheels on the ROLLWAY Portable Steel dock plate make it easy for one man to move. After ROLLWAY dock plate is in the desired position, the handles and wheels fold conveniently out of the way.



Choice of sizes and capacities. Write today for FREE illustrated literature.

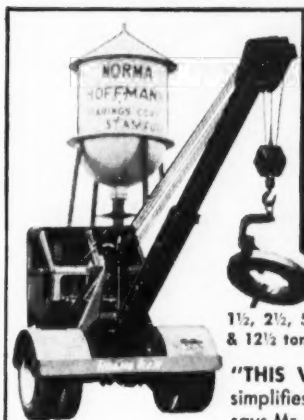
DISTRIBUTORS WANTED

**MANUFACTURED BY
WOODFORD HYDRANT COMPANY**

1626 DELAWARE • DES MOINES, IOWA

Circle No. 145 on Reader Service Card for more information
FLOW • JANUARY, 1954

Circle No. 130 on Reader Service Card for more information



KRANE KAR
SWING-BOOM MOBILE CRANE

**SAVED US
\$3824.24 IN
8 MONTHS,"**

Says V. James DeNaples,
TECHNICAL SERVICES FOREMAN,
NORMA HOFFMANN
BEARINGS CORP.

1½, 2½, 5, 10,
& 12½ ton cap.

"THIS VERSATILE YARD CRANE
simplifies our materials-handling,"
says Mr. DeNaples, "cuts operations
and travel trips, saves us a considerable

amount of work and time. Our **KRANE KAR** speeds unloading of incoming materials . . . transports and stacks them at storage . . . loads them on floor trucks for delivery inside (long shafts of tubing, stacked bearing ring forgings, 800 and 1000 lb. coils of steel strip). Also loads outgoing scrap and waste drums on trucks and gondolas; tows sludge wagon from grinding waste chute to waste dump, up-ends it, tows it back." **MONTHLY NET SAVINGS — \$478.03!**

Gas or diesel, 9 to 37 ft. booms or adjustable telescopic booms; pneumatic or solid rubber tires; electric magnet, clamshell bucket and other accessories.

Ask for Bulletin No. 89



SILENT HOIST & CRANE CO., 888 63rd ST., BROOKLYN 20, N.Y.

**"Most Efficient
Yard Crane
We've Used"**

Says

Henry J. Hettinger
Asst. Supt. in Charge
of Maintenance
Greenpoint Works
Brooklyn Union Gas Co.

KARRI-GO
FRONT-BOOM MOBILE CRANE
5 and 7½ Ton Cap.



FEATURE: "Live Boom" with Hydraulic Power Tapping

"Our **KARRI-GO** saves us time and money," says Mr. Hettinger. "The short turning radius makes it very flexible. It does many jobs faster, more economically than our three big cranes. We use it indoors and outdoors . . . for removing and installing underground cable, 12" pipe, valves, large valve bonnets and gates. On repairs, the **KARRI-GO** carries motors, speed-reducers, compressors, pumps, and other machinery to and from the machine shop. Handles reels, 55-gal. drums, steel beams and forms; it loads and unloads trucks; stacks materials for storage. This **KARRI-GO** has to cover a lot of ground . . . the area of our yard is over 115 acres. To carry bigger loads and cut down travel trips, we often attach a trailer to the pintle hook. Doing a fine job here."

Send for Bulletin #732

Mrs. of **KRANE KAR** Swing-Boom Mobile Crane

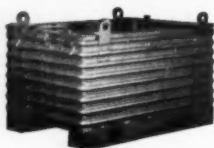
SILENT HOIST & CRANE CO., 888 63rd ST., BROOKLYN 20, N.Y.

Circle No. 151 on Reader Service Card for more information

Here's why logged BRUSCO handling equipment increases efficiency

No. 558 BRUSCO CORRUGATED STEEL BOXES

Save floor space — stack safely from floor to roof. Four way entry for fast, efficient handling. Equipped with crane lugs for movement by crane. Fabricated from heavy gauge corrugated steel to give added rigidity and maximum strength. Thoroughly and securely arc welded for longer, maintenance free life. Made in various sizes and load capacities to suit your requirements.



No. 559 BRUSCO CORRUGATED SKID BOX

Saves valuable floor space and speeds production. Made in all sizes and various gauges of steel to fit any load capacity. Stack from floor to roof.



No. 1210 BRUSCO SELF DUMPING HOPPER

Speeds production and saves labor in handling parts and materials in your plant. Easy to move and simple to operate. Hopper is fabricated of heavy steel plate thoroughly reinforced. This unit is equipped with a new, cast steel rocker and hardened pins for longer service. Made in ½, 1, 1½ and 2 cubic yard capacities. Underclearance optional.



Write today for new Bulletin No. 500 presenting the most complete line of Part Boxes and Brusco Self Dumping Hoppers on the market.

Brusco

HANDLING EQUIPMENT

BRUMMELER STEEL PRODUCTS CORPORATION

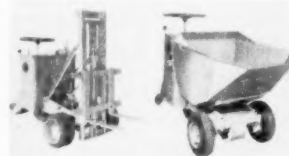
1410 Ionia Ave., S. W. Grand Rapids, Michigan
Circle No. 28 on Reader Service Card for more information
150

NEW EQUIPMENT

Continued

New Features on Power Barrow

Incorporated in the latest Moto-Bugs—power wheelbarrows which can be converted to flat bed trucks or fork lifts—are a number of new safety and performance features. A “dead man” internal expanding brake system instantly stops the machine when the operator's foot is off the treadle. Brakes



are adjustable. On the Fork Lift version, soft core rubber tires add to driver comfort, eliminate the possibility of punctures and blowouts. These are optional for other Moto-Bug types.

Now standard on all versions is a cog-type V-belt of rayon cord construction said to provide more efficient transmission of power from the 6-h.p. gasoline engine to the drive wheels. The cog design reduces belt stretch and slippage. Inspection of the V-belt and other engine parts has been simplified by incorporation of a good-sized inspection door in the front panel of the cowl. Rear of engine is also open so that the power plant can be inspected from both sides. Moto-Bugs are produced by Kwik-Mix Co., subsidiary of Koehring Co.

Circle 186 on Reader Service Card for more information

Cell Puller

For use in removing cells from batteries for examination or repair, a new cell-puller has been developed by Gould-National Batteries, Inc. The tool, generally used in sets of two, consists of a U-shaped steel loop brazed to a hexagonal steel nut with specially cut threads



tapering from bottom to top. In use, nuts are screwed down over the lead posts, a piece of wood placed in the loops, and the cell is pulled from the battery by chain or rope and hoist.

Circle 187 on Reader Service Card for more information

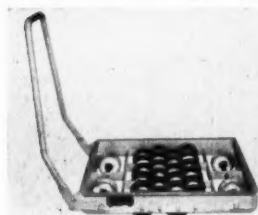
Power Driven Conveyor Curve

Any package that can be handled on gravity rollers will travel over a “Streamliner” power driven roller curve, says the manufacturer, Harry J. Ferguson Co. It is intended to eliminate slow-ups, jamming and stoppage, and to maintain uniform rate of flow for conveyor lines. Available in 90 and 180 degrees, it uses 2 in. diameter rollers set in 5½x10 in. formed steel channels,

on either four or six inch centers. Width between channels can be from 10 to 30 inches in two inch increments. Drive is a $\frac{1}{2}$ h.p., 115/230 V., 60-cycle, single phase, reversible motor with reducer and chain drive.

Circle 188 on Reader Service Card for more information

Pallet Dolly



Maneuverability, ease of operation and ability to roll on rough or slatted floors are among features listed by Roll Rite Corp. for their improved Universal Pallet Dolly. Twenty four 6 in. wheels, which support loads and provide contact on rough surfaces, are available with rubber or aluminum alloy tread to suit operating conditions. Front and rear wheels are mounted on spring loaded axles to assist in guiding the pallet and to allow 360 degree turning. Standard sizes are 30x40 and 40x48 in.; larger sizes can be supplied.

Circle 189 on Reader Service Card for more information

Baskets for Delicate Parts



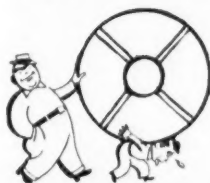
Segregation of delicate parts and those with precision finished surfaces is provided by pin racks produced by Jaxon Wire Products. Lightweight and sturdy, of welded wire, they are said to provide convenient and effective "packing case" protection during processing and through such operations as degreasing, inspection and handling between operations. Racks stack for storage and transportation while providing individual support, separation and safety to each part. Spacing and number of support pins per inch may be varied to meet particular requirements.

Circle 190 on Reader Service Card for more information

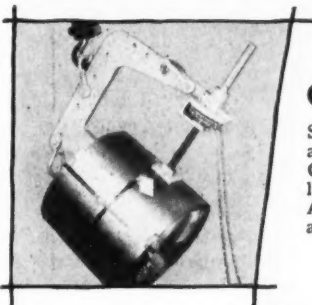
Safety Device for Doors

A new safety feature is now offered on industrial doors manufactured by Clark Door Co. It is an "instantly reversible" device, which is contained in a strip of hollow tubing extending along the closing edge of the doors. If a person, or any object, meets the closing door, the slightest pressure on the tubing flashes an electrical "reverse"

Coil Handling Problem?



DIXON has the answer!

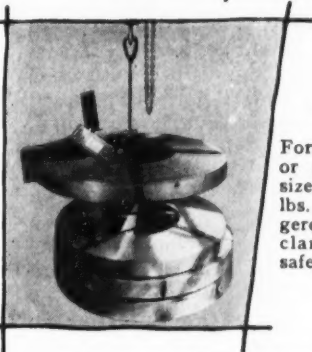
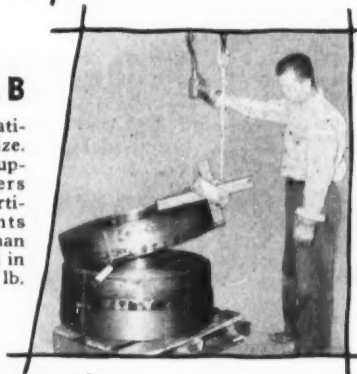


COIL HANDLER

Save space and avoid hazards by storing coils on end. Coils up to 48" wide can be lifted, turned and stacked. Available in 7,500, 10,000 and 15,000 lb. capacities.

COIL GRAB

Dixon Grab automatically adjusts to coil size. As crane hook moves upward the coil transfers from horizontal to vertical position. Prevents stock damage. One man can operate. Standard in 5 models up to 5,000 lb. capacities.



COIL LIFT

For ease in lifting, weighing, or stacking coils of varying sizes and weights up to 2,500 lbs. Pry-bars, chains, or dangerous makeshift hooks and clamps eliminated. Assures safety in handling.

● DESIGNERS and BUILDERS of SPECIAL CONVEYORS and HANDLING EQUIPMENT. Difficult problems requiring originality should be referred to our engineering department for quotation.

DIXON Automatic Tool Inc.
2303 TWENTY-THIRD AVE.
ROCKFORD • ILLINOIS

Circle No. 52 on Reader Service Card for more information

Circle No. 103 on Reader Service Card for more information

PICK-UP NAILS etc., with the

New SERIES 70 MULTIFINISH HAND MAGNETOOL

EASY TO OPERATE • LABOR and MATERIAL SAVER

PICK-UP **RELEASE**

for Rapid and Convenient Pick-up of small parts, nails, etc.

• PERMANENT • NON ELECTRIC • NO BATTERIES •

MODEL 71
9" x 5" x 1 3/4"
Picks up 2-3 lbs.
\$19.75

MODEL 72
9" x 5" x 3 3/4"
Picks up 4-5 lbs.
\$38.00

MODEL 74
9" x 5" x 6 1/4"
Picks up 8-9 lbs.
\$75.00

10 DAY FREE TRIAL
Other Products...
Rotary Floor Sweepers
Tank Rotaries
Magnetic Tools

... Separates steel parts from non-ferrous metals... Eliminates steel particles from chemicals, food, textile fabrics... Removes heat treated parts from carburizing material... Draws steel parts from tumbling material... Increases efficiency in the handling of extremely hot or cold parts.

MAGNETOOL®

Division of MULTIFINISH MFG., CO.
26341 W. Eight Mile • Dept. 367 • Detroit 19, Mich.

HANDLING BULK MATERIALS?

"TAKE IT UP A FLO-TUBE®"

CANTON STOKERS

To fill 3 or more hoppers use gate-valves in Flo-Tube horizontally. Below, filling 2 hoppers with "Y" chute.

The spiral conveyor of steady, dependable service. Sturdy cast iron trough bolts together in 3 ft. sections, capped with steel plates for easy removal if ever necessary. Built to take the abuse of coal, yet with tolerances just right to handle materials from grain size to lump.

Hopper level maintained by "off-on" automatic switches. Exposed end for pick-up

CANTON STOKER CORP.

SPECIALISTS IN AUTOMATIC COAL FIRING, HANDLING AND CONTROL EQUIPMENT
108 ANDREW PLACE S. W. • CANTON, OHIO

Circle No. 31 on Reader Service Card for more information
152

NEW EQUIPMENT

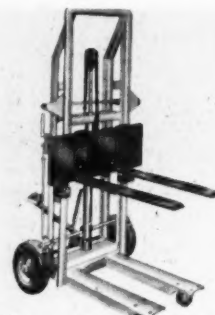
Continued

so that the door instantly re-opens. The feature is available on Bi-Fold, Horizontal Sliding, or Vertical Lift type doors.

Circle 191 on Reader Service Card for more information

Hand Lift Truck

The "one man" Safeway hydraulic lift truck is said by the manufacturer—Safeway Industrial Equipment Corp.—to raise loads of 1,000 lbs. to a height of 53 inches easily and safely. It operates in narrow aisles and turns easily in close quarters. A combination "snap-on" plate allows it to be used as a platform truck when forks are not required. For one-man use, it has foot lever operation, safety release pedal and wheel lock.



Circle 192 on Reader Service Card for more information

The New GRAND SHOP CADDY

WITH New 4 Speed VARILIFT

One Man Lifts 500 lbs. 54 inches High! • Light Weight • Compact • Easy Handling • Perfect Balance

Lifts, Moves and Stacks Kegs, Boxes, Dies, Tools, Motors, Coils, Bags, Tote Pans.

A 4-speed hydraulic lift assembled into a heavy duty hand truck, forms industry's most versatile material handling tool.

The Shop Caddy takes the heavy work out of loading trucks, storing parts on shelves and bins, stacking boxes, kegs and tote pans, moving and lifting dies into position and hundreds of other similar jobs.



Call us today for a Free Trial in Your Plant

Standard Shop Caddy			
Model	Lifting Height	Platform Size	Capacity
4036	36 in.	20" W. x 16" L.	500 lbs.
4034	54 in.	20" W. x 19" L.	500 lbs.

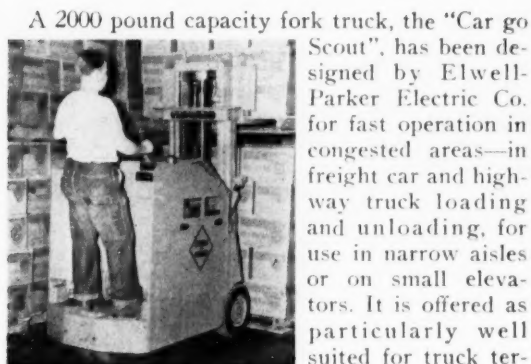
Platform descends to floor level for easy loading. 8 inch Molden Rubber Wheels and Varilift 4-speed system are standard equipment.

ALLIED MFG. & SALES CO.

201 N. WELLS ST., CHICAGO 6, ILL.
MATERIALS HANDLING DIV. OF GRAND SPECIALTIES CO.

Circle No. 2 on Reader Service Card for more information
FLOW • JANUARY, 1954

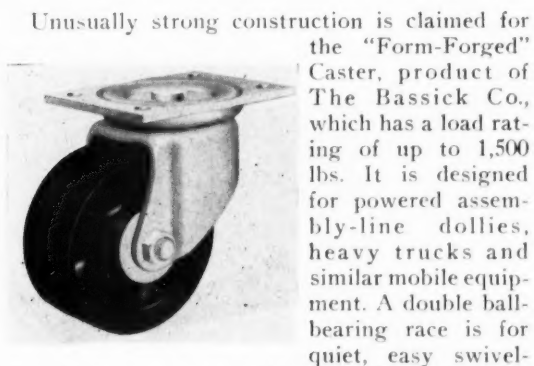
Fork Truck for Narrow Aisles



A 2000 pound capacity fork truck, the "Car go Scout", has been designed by Elwell-Parker Electric Co. for fast operation in congested areas—in freight car and highway truck loading and unloading, for use in narrow aisles or on small elevators. It is offered as particularly well suited for truck terminal transfer and loading. Features include: end control for speed and convenience of operators who must get on and off the truck frequently; short wheelbase (43½ in.) for turning in crowded areas; specially designed device to eliminate steering wheel kick-back; 68 inch high uprights and full initial lift to permit stacking in low head room areas; and heavy duty drive axle to withstand high speeds and fast acceleration. Fast, smooth starts are said to be made with one handle controlling four speeds in both directions. The hydraulic lift has controlled lowering and an automatic unloading device to prevent overloading.

Circle 193 on Reader Service Card for more information

Caster For Heavy Loads

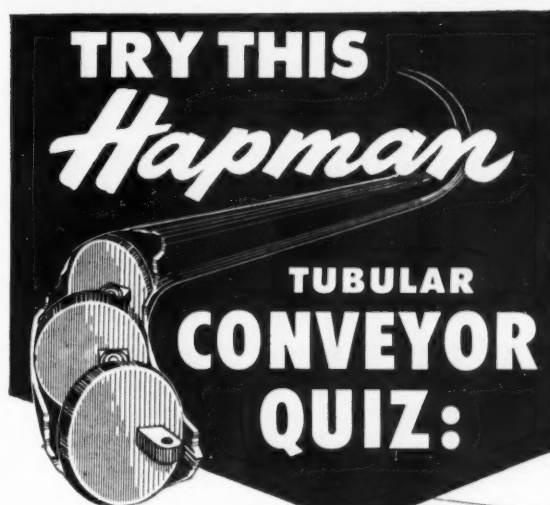


Unusually strong construction is claimed for the "Form-Forged" Caster, product of The Bassick Co., which has a load rating of up to 1,500 lbs. It is designed for powered assembly-line dollies, heavy trucks and similar mobile equipment. A double ball-bearing race is for quiet, easy swiveling. Raceways are case-hardened for longer life, the kingpin is said to be extra heavy to provide a high safety factor at this point, and the caster is structurally shaped of heavy gauge steel. Available in 5, 6, 8 and 10 inch sizes, with semi-steel, forged steel or rubber-tread wheels, it may be ordered in either swivel or rigid types.

Circle 194 on Reader Service Card for more information

Tractor with Oil-type Clutch

Standard equipment now on the D7 track-type Tractor of Caterpillar Tractor Co. is an oil-type flywheel clutch. In this mechanism, all of the working parts operate in oil, with friction said



Let's assume you're a Conveyor-Project Engineer employed by Hapman —

QUESTION 1—Which materials in panel would you advise can be efficiently handled by Hapman Tubular Sealed-pin Chain Conveyors?

QUESTION 2—To elevate a granulated chemical 29 ft. above floor, at 2,000 lbs. per hour, what motor would you specify?

1 H.P. _____ 2 H.P. _____
3 H.P. _____ 5 H.P. _____

QUESTION 3—A prospect asks, "What is the outstanding advantage of a Hapman Tubular Conveyor?" What's your reply?

ANSWERS: 1—All now successfully handled except sticky molasses. 2—One horsepower. 3—Hard to answer. In one case, ability to convey *wet* material is vital; in another the Hapman's air-tight seal keeps moisture or dust *out*—or fumes *in*. Ability to curve around obstacles may be essential. Your best answer: "They cut costs!"

NOW SEND YOUR QUESTIONS!

Write for details and Bulletin F-154



Circle No. 70 on Reader Service Card for more information

YES _____ NO _____	 CAST IRON CHIPS
YES _____ NO _____	 POWDERED CLAY
YES _____ NO _____	 WET "SPENT" GRAIN
YES _____ NO _____	 LUBE FILTER CAKE
YES _____ NO _____	 POISON-DUST INSECTICIDES
YES _____ NO _____	 QUENCH TANK SLUDGE
YES _____ NO _____	 PROCESSED MOLASSES
YES _____ NO _____	 CARBORUNDUM DUST
YES _____ NO _____	 GRANULATED SULPHUR
YES _____ NO _____	 SHIP-BOILER COAL

Circle No. 98 on Reader Service Card for more information

YOU Can Build Your Own Overhead Conveyor with UN-O-VEYOR parts



Now you can lay out and erect your own overhead conveyor from standard UN-O-VEYOR parts at a price within the budget of every plant. Only UN-O-VEYOR has exclusive patented universal-jointed flexible chain with unique self-locking principle for fast assembly.

For complete details, illustrations, and installation instructions, WRITE FOR OUR NEW 16-PAGE CATALOG.

DEALERS WANTED

**Michna
SYSTEMS**
5051 S. WESTERN AVE.
CHICAGO 9, ILL.

NEW EQUIPMENT

Continued

to be reduced to a point where the part will operate from two to four times longer than an equivalent dry clutch before major adjustment or overhaul is necessary. It is expected that under ordinary operating conditions, the overhaul period of this clutch will coincide with the normal overhaul of the engine. Four of the company's track-type machines are presently equipped with the new clutch. It was earlier made standard equipment on the D8 and D6 track-type Tractors and the No. 6 Shovel.

Circle 195 on Reader Service Card for more information

Wear-Resistant Floor

Intended for areas subjected to most severe industrial usage, a new floor named "Metile" has been introduced by the Flash-Stone Co. It consists of steel plates of approximately one square foot embedded in especially installed concrete. Plates are so constructed that numerous anchorage points secure them to the



PALLET RACK

DO-ALL BOX

FLEXIBLE PALTIER

PALTIER HARDWARE

PYRAMID RACK

"Saved Cost of New Warehouse"

says
PALTIER USER

Paltier

STORAGE SYSTEM

increases storage space up to **75%** and more—decreases man handling as much as **75%**

ASK US: PALTIER studies your storage problem—engineers and designs a system for your specific needs. Many PALTIER installations pay for themselves "right from the start."

◆ This booklet tells the PALTIER story, ask for it today.

THE PALTIER CORP.
1709 Kentucky St., Michigan City, Ind.

Circle No. 111 on Reader Service Card for more information

154

GET THE MOST FOR YOUR MAINTENANCE DOLLAR!

With this $\frac{3}{4}$ ton capacity unit, you can haul bulk loads like scrap or concrete—haul heavy repair or maintenance items on the flat bed—plow snow or do light grading with the blade accessory—keep down weeds or control insects with 50 gal. sprayer attachment.



Interchangeable bucket and flat bed latch onto Prime-Mover chassis . . . blade and sprayer attached in jiffy. Works indoors—outdoors, through narrow doors, on rough ground, in all kinds of weather. Take the load off your maintenance men with a Prime-Mover. Write for On-the-Job data. Prime-Mover Co., Muscatine, Iowa.

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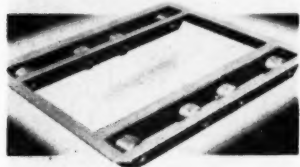
FLOW • JANUARY, 1954

concrete and prevent buckling movement either vertically or horizontally. Metile floors are said to be equally suitable for surfacing over new or old concrete, sound wood bases, wood block or brick, with some variation in the material selection in the basic bedment grouting course in which plates find permanent anchorage. The design permits small, protected islands of grouting concrete bedment to surface and form an effective non-skid pattern.

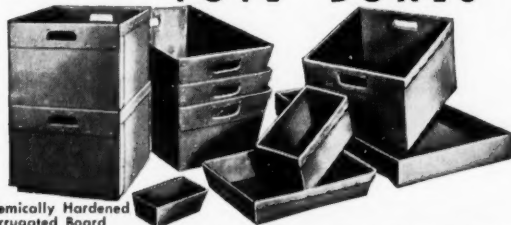
Circle 196 on Reader Service Card for more information

Pallet Roller

Effortless movement of palletized loads in any direction is the function of Ace "Swivel King" pallet rollers manufactured by Frank L. Robinson Co. They are designed to speed material flow and product movement and remove congestion in any areas when fork trucks are not available. Large diameter rolls of heavy gauge steel have crowned ends for free rolling and floor protection. Bearings are heavy duty, fully lubricated. The frame is welded, constructed of high tensile strength steel, and the design is said to retain parallelism



FAMOUS "CHEM-BOARD" CONVOY TOTE BOXES



*Chemically Hardened Corrugated Board

SOLD THROUGH LOCAL INDUSTRIAL DISTRIBUTORS

Cost—weigh—50% to 60% less than steel. A wide range of sizes in standard and custom made NESTING, STACKING, VERTICAL TOTE BOXES. Write for complete information, prices, name of distributor in your area.



CONVOY RECORD STORAGE FILES

Sold Only by YOUR LOCAL STATIONER Used by most famous names in industry and businesses of all kinds. CONVOY "CHEM-BOARD" files for record storage made in letter, legal, and 12 other sizes. Stack to ceiling, mate together. Call your local stationer or write for name of stationer nearest to serve you.

CONVOY, INC.

Canton 6, Ohio

P. O. Station B, 216-F

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Immediate Shipment

STYLE 600 STACKING BOX



An ideal all-purpose shop box with rigid handle and hook hole each end. Sturdy all-welded construction. Heavy skids act as positive stacking lock and reinforce box at points of maximum wear. Will stack with style 500 stacking bin of same length and width.

OTHER SIZES AND STYLES AVAILABLE Complete Shop Box and Shop Equipment Catalog and Discounts on request.

Product Number	Width	Length	Height	Gauge Steel	Price Plain	Price Green
601-18	10"	16"	6"	18	1.71	1.93
602-16	12"	18"	8"	16	2.59	2.89
603-18	12"	18"	6"	18	2.04	2.32
603-16	12"	18"	6"	16	2.37	2.65

PHONE • WIRE • WRITE
Baldwin 9-1805

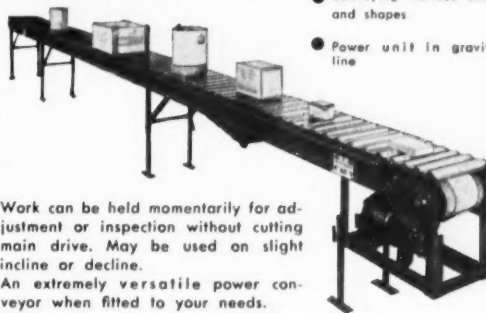
BAY PRODUCTS INC.

1561 W. Indiana Ave., Phila. 32, Pa.

METZGAR LIVE-ROLLER CONVEYOR

Specifically Recommended for

- Moving sharp-cornered and rough-edged items
- Conveying various sizes and shapes
- Power unit in gravity line



Work can be held momentarily for adjustment or inspection without cutting main drive. May be used on slight incline or decline.

An extremely versatile power conveyor when fitted to your needs.

Standard widths: 11 1/2" — 15" — 18" — 24". Length to suit. Conveyors up to 30' are powered by a 110 V. single phase gearhead A.C. or D.C. motor; longer units, 220/440 three phase A.C. or D.C. Roller spacing as required. Factory lubricated for life.

Our engineers can help you most when you explain your requirements fully. Ask for Bulletin J-1.

- Production-line work movement
- Handling heated and heat-treated items

METZGAR CONVEYOR CO.

423 Douglas St. N. W.

MFRS. OF WHEEL & ROLLER GRAVITY & LIVE ROLLER CONVEYORS • POWER BELT CONVEYORS • SWITCHES • ACCESSORIES & REEL DOLLIES

GRAND RAPIDS 4, MICH.

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You can provide easy mobility to a variety of industrial products with

IRONBOUND ALL-PURPOSE HANDLING UNITS . . .



POPULAR IRONBOUND



● An easy to handle ruggedly constructed unit for carrying bulky and heavy loads at lowest cost. Seven standard sizes with one or two push handles makes it easy to select the proper truck for your requirements. Ask an Ironbound engineer for suggestions.



The HANDY
for furniture and similar items.



The HAULER
for cases, crates, tote boxes, etc.



The HUSKY
for general use throughout the plant.

THE IRONBOUND "SAFETY-SKID" WITH ROUND CORNERS

Ironbound construction assures long hard use with complete safety to product and operator. Still the time proven method for handling of materials efficiently and economically.



IRONBOUND

BOX & LUMBER COMPANY

Materials Handling Division

30 HOFFMAN PLACE • HILLSIDE, N. J.

MANUFACTURERS OF QUALITY BUILT SKIDS, SEMI-LIVE SKIDS, FLOOR TRUCKS, ROLL TRUCKS, DOLLIES AND PRY BARS

NEW! NARROW BELT UNITIZED CONVEYOR

BELT WIDTHS
OF 1" TO 6"



For Handling Small
Dimension
Light Weight Containers

Easy to install, economical to operate, this new Unitized Conveyor is available in any length of 5' increments, i.e. 5', 10', 15', 20', etc.

CONSTRUCTED of STANDARD PARTS

making it easy to lengthen the conveyor if increased production makes this necessary. Obsolescence of equipment is eliminated. Ideally suited for the pharmaceutical, cosmetic, aerosol packaging, drug and chemical, plastics, food products and baking industries.

Wider widths and boosters available.
Advise us of your requirements.

FREE!



ISLAND EQUIPMENT CORP. DEPT. FI
27-01 Bridge Plaza North
Long Island City 1, N. Y.
Please send particulars on the Unitized Narrow Belt Conveyors.
COMPANY.....
BY.....
ADDRESS.....
CITY..... STATE.....

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NEW EQUIPMENT

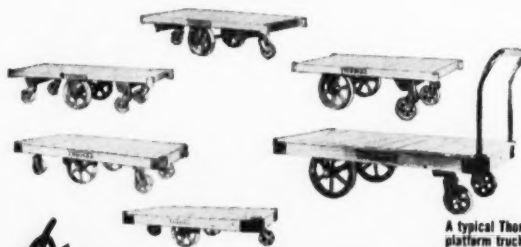
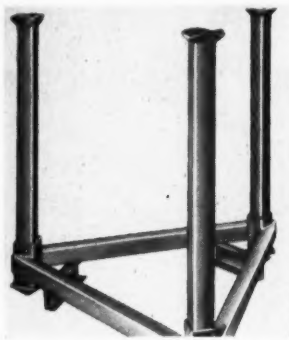
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and alignment under all conditions. Hexagonal axles, cotter-keyed to the frame for easy service, fit in hexagonal holes to prevent axles from turning.

Circle 197 on Reader Service Card for more information

Triangular Coil Racks

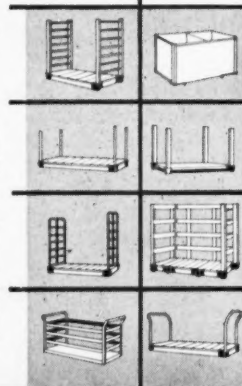
Economy and flexibility are claimed for the Paltier Triangular Coil Rack made by Paltier Corp. Three point suspension is said to permit high stacking stability. The rack can be picked up from any angle, stacked and moved easily with fork lift truck, hand pallet truck, or hoist. Equipped with casters or set on a dolly it may be moved manually. It stacks empty in less floor space than more conventional racks.



A typical Thomas platform truck No. 340-A.

Choose FROM SIX DIFFERENT TRUCK CHASSIS and 1000 superstructures

The Thomas "Job-Suited" plan enables you to choose quickly and accurately the most efficient truck for your particular freight or materials handling problem. **FIRST**—you choose any chassis or running gear that will carry your load. **SECOND**—you choose one of the 1000 superstructures to hold your load. **PRESTO**—you have a Thomas "Job-Suited" truck specially tailored to your needs! **ANY CAPACITY, ANY SUPERSTRUCTURE, FOR ANY USE!**



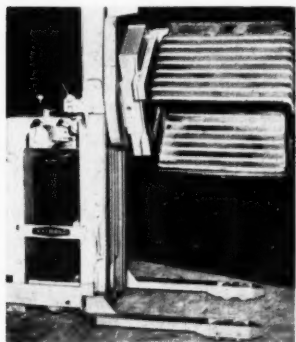
Write for Free Catalog giving "Job-Suited" particulars.
THOMAS TRUCK & CASTER CO.
421 Mississippi River, Keokuk, Iowa

Circle No. 138 on Reader Service Card for more information
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With wood or steel rectangular or square deck, it can be converted into a standard rack for storing small, irregularly shaped parts or cartons. The new rack, designed and produced to user's requirements, has Paltier nesting pyramids for stacking.

Circle 198 on Reader Service Card for more information

Revolving Head Attachment

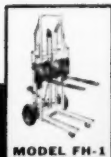


Available on the narrow aisle, rider-type electric trucks manufactured by The Raymond Corp. is a new Revolving Head Attachment. It is designed to handle roll-over boxes containing small parts for machine feeding. One truck can pick up the loaded box in the storage area and carry it directly to the machine—

through narrow aisles and congested areas—without the necessity of transferring the load to smaller equipment. The truck can travel laterally through aisles 36 inches wide and right angle stack from aisles five to six feet wide. It is avail-

Safeway LIFT TRUCKS

are right for your business



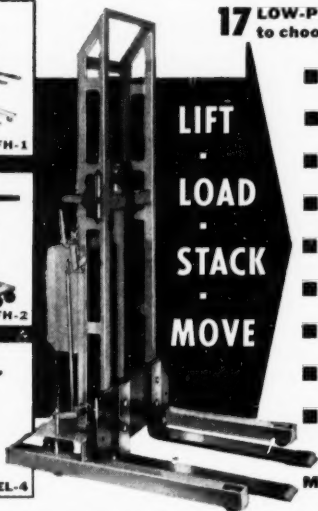
MODEL FH-1



MODEL FH-2



MODEL EL-4



17 LOW-PRICED Models to choose from

LIFT
•
LOAD
•
STACK
•
MOVE

- PARTS
- DIES
- COILS
- BOXES
- BALES
- BARRELS
- SKIDS
- PRODUCTS
- DRUMS

MODEL EL-20

SAVE time, money, manpower with this modern equipment. Powerful Safeway portable Lift-Trucks are now available in a wide range of hydraulic and battery powered models with 1250 pound capacity.

ALL MODERATELY PRICED • WRITE FOR SPECIFICATIONS AND PRICES

Safeway

INDUSTRIAL EQUIPMENT CORP.
184 N. FRANKLIN ST. • CHICAGO 6, ILL.

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FLOW • JANUARY, 1954

Circle No. 121 on Reader Service Card for more information

Roll a NEW Floor OVER the old with

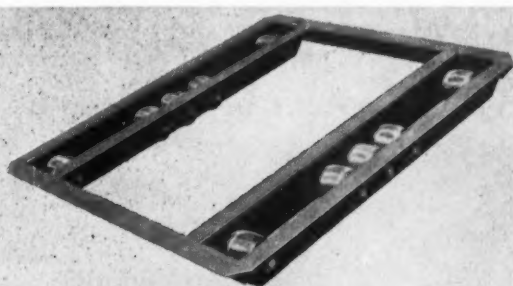


Abolish downtime due to floor failures. Just roll **Redi-Roll** over the old floor to a compacted 1/4" thickness and USE AT ONCE. It's spark-proof! It's tough! It's industry's best floor buy. Write for details now... today!

ROCK-TRED

Corporation

Manufacturers of a Complete Line of Building Maintenance Materials
7440-7450 North St. Louis Avenue • Skokie, Illinois
In Canada: Rock-Tred Corporation (Canada) Limited, Toronto 5



ACE
REEFER
KING
PALLET ROLLERS



FOR SLATTED DECKS—EASY TURNING!

Because of refrigerator car construction, unit pallet loading and unloading has been restricted to a minimum. The ACE REEFER KING efficiently and economically solves all problems of pallet loading and unloading of refrigerator cars. The ACE KING is also a proven asset in other plant operations where the movement of pallet loads is concerned. Ask for Eng. Bulletin 103K.

Distributorships Available

FRANK L. ROBINSON COMPANY

Industrial Engineers • Manufacturers • Distributors
LATHAM SQUARE BLDG. OAKLAND 12, CALIF.

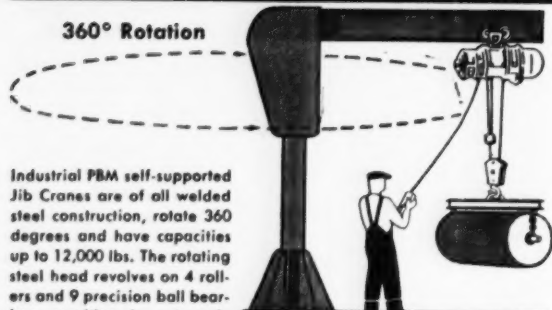
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Circle No. 78 on Reader Service Card for more information

Industrial JIB CRANES

HEAVY DUTY
Precision engineered and built
for smooth efficient operation

360° Rotation



Industrial PBM self-supported Jib Cranes are of all welded steel construction, rotate 360 degrees and have capacities up to 12,000 lbs. The rotating steel head revolves on 4 rollers and 9 precision ball bearings resulting in extremely smooth operation — unsurpassed by any other crane of its type. The high standard of workmanship and material, coupled with reliable performance make Industrial Jib Cranes your best buy.

Write for Catalog

Industrial manufactures 6 other types of Jibs and many models of Overhead Traveling Cranes to cover every need. Consult with Industrial for cranes to solve your material handling problems.

INDUSTRIAL CRANE & HOIST CORPORATION

Formerly Industrial Equipment Co.
331 NORTH ADA STREET CHICAGO 7, ILLINOIS
Overhead Cranes • Jib Cranes • Monorail Systems • Crane Runways
Representatives in Principal Cities

NO WASTE EFFORT

...when you move loads over



ROWE ADJUST-A-DOCKS

There's never a hitch in straight-line travel between plant and truck or rail car. With Rowe Adjust-A-Docks those time-consuming, expensive rehandlings during loading or unloading are eliminated.

Write today for a free, profusely illustrated and informative booklet detailing Rowe equipment for more effective dock handling.



ROWE METHODS INC.

2534-C DETROIT AVENUE

CLEVELAND 13, OHIO

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158

NEW EQUIPMENT

Continued

able in capacities up to 3,000 pounds and can be furnished with elevated heights up to 12 feet. Travel speeds to 4½ miles per hour and elevating speeds of 32 feet per minute are regularly supplied. The attachment is said to be also applicable for stacking and storage of pallets in warehousing operations or skid loads of work-in-process in manufacturing areas.

Circle 199 on Reader Service Card for more information

Close-to-Floor Conveyor

Illustrated is a belt conveyor, product of the Metzgar Co., which has a side mounted drive motor to permit close-to-the-floor installation. It is recommended by the manufacturer for loading and receiving where transports cannot reach storage



and receiving areas. This model is 15 in. high, 65 ft. long, with an 18 in. resin impregnated belt. It is driven by a 5 H.P. motor and 12 in. pulley at 60 F.P.M. Rollers and slide beds under the belt provide a capacity of 60 lbs. per foot. The conveyor may be installed on the horizontal or on medium inclines.

Circle 200 on Reader Service Card for more information

Light Weight vs Heavy Duty

A heavy duty hand truck for use on barrels and cases weighing up to 700 pounds has been placed on nationwide distribution by the Honeyman Mfg. Co. Designated their Model K, the truck itself weighs only 20 pounds. Its construction is welded tubular aluminum and the aluminum alloy blade has extra thickness at the base for added strength, and tapers to a sharp entering edge. Smooth quiet mobility is provided on solid rubber tires or optional semi-pneumatic or cushion tires.



Circle 201 on Reader Service Card for more information

FLOW • JANUARY, 1954

SPIRAL SPRING . . .

(Continued from page 143)

which is applied to the individual lamination and allowed to dry. Laminations are then assembled, placed on a fixture under pressure and cured by heat in an oven.

As it is done now, an operator coats each lamination by placing it on a paper clip or hook and dipping it into a small container of adhesive. It is then placed on a peg board (nails driven in wood) to air dry for from 10 to 15 minutes.

An operator can average approximately six laminations per minute, or 2,760 for an eight hour day (two 10-minute rest periods allowed). At an average hourly rate of \$1.30, the cost per piece for this operation is \$0.0033.

Cost of Improved Method

Parts Feeder	\$325.00
Electric motor and gear reducer	40.00
Pressure roller and mounting hardware ..	17.00
Spiral, support rod, brackets etc.	50.00

Tank or adhesive	12.00
Heating elements	15.00
Installation, tryout and adjusting	30.00
Total	\$439.00

Savings:

The recommended speed for the spiral is 24 R.P.M. The daily output for an 8 hour day is therefore: $24 \times 60 \times 8 = 11,520$ laminations. Under the old method the operators daily wage was \$10.40

$$\frac{\$439.00}{\$10.40} = 47.2 \text{ or } 48 \text{ days.}$$

The improved method will pay for itself in 48 working days. The only expense will be electric power to run the parts feeder and pressure roller motor, plus maintenance. Total should not exceed \$5.00 per month. At 230,400 per month of 20 days, cost per lamination after 48 days will be \$0.000022.

This is a saving of \$0.0033 — \$0.000022, or \$0.00379 per lamination.

Circle No. 50 on Reader Service Card

PNEUMATIC HOIST with Rotary Air Motor

Capacities 250 lbs. to 1 ton Fast Lifting Speeds



Pulseless, rotary, air motor; no reciprocating parts.

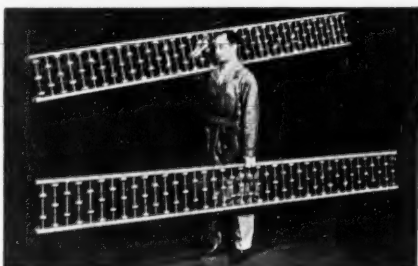
- Worm Geared
- Compact—Light Weight
- Exceptionally Smooth Running
- Close, Sensitive Control

PT Hoist shown with monorail trolley; can also be furnished with upper suspension hook. Write for P.T. Bulletin 708.

DETROIT HOIST & MACHINE CO.
8209 Marrow St., Detroit 11, Mich.
Designers and Manufacturers Since 1905

Speedways gives you important EXTRAS

with the
NEW
Aluminum
Gravity
Wheel
Conveyors



- EXTRA Portability:** The feather-lightness makes them easier to lift and move. Cuts set-up, knock-down and stow-away time, makes even your smallest-sized worker capable of handling these chores with complete ease and safety.
- EXTRA Strength:** 33 1/3% lighter than steel, yet stronger, tougher and with the same capacity of steel conveyors. They'll move 850 lbs. of live load per 10 lineal feet!
- EXTRA Utility:** Speedways Aluminum Gravity Wheel Conveyors will work for you in every phase of your material handling, plus having extra utility in danger areas where the non-sparking aluminum frames help reduce hazards.
- EXTRA Savings:** Add up these extras! They mean savings in material handling costs . . . in labor time. . . They mean reduced accidents and production speed-up.

GET THESE EXTRAS — with SPEEDWAYS' NEW ALUMINUM GRAVITY WHEEL CONVEYORS

See your SPEEDWAYS Distributor or write today for new Aluminum Gravity Wheel Conveyor Bulletin. No obligation, of course. Write Dept. F-12.

SPEEDWAYS
CONVEYORS, INC.

202 RHODE ISLAND ST.
BUFFALO 13, N. Y.
Also mfg. in CANADA,
UNION of SO. AFRICA

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FLOW • JANUARY, 1954

JAKES

America's Finest
Industrial Trucks and Trailers



MODEL NO. 15-B-6P

Various platform sizes — Capacity 6,000 lbs.
SPECIFICATION SHEETS AVAILABLE

JAKES FOUNDRY COMPANY

Established 1891

2800 Charlotte Avenue

Nashville 9, Tennessee

Circle No. 83 on Reader Service Card for more information

Classified Advertising Section

USED EQUIPMENT — MEN — JOBS — LINES

Rates: for "Positions Wanted" \$8.00 minimum, limit 25 words. For all other classifications \$10.00 minimum for 25 words; each additional word 25c. Boldface type or all caps, \$12.00 minimum for 25 words, each additional word 35c. Box address counts as five words. All insertions payable in advance.

FOR SALE

TWO USED ELECTRIC FORK TRUCKS AVAILABLE FOR IMMEDIATE DELIVERY Approximately 6 months old. Ready for inspection. Baker-Raulang 4000# capacity trucks at 48" load length. Cushion tires. Wheelbase 43". Lift 126". Collapsed mast height 83". Pallet forks 42". Model FTHE-40/48, equipped with H-36 Ready Power unit will sell for \$4900. Model FTH-40/48, equipped with Gould battery 18KHZ19 will sell for \$5400. Both FOB Syracuse, New York. MATERIAL HANDLING PRODUCTS CORP., P.O. Box 203, Eastwood Station, Syracuse 6, New York, Phone 73-5261.

LF-50 Automatic Skylift Fork Truck complete with 360° roll grab for rolls up to 3500# and 52" diameter, two Exide batteries, charging equipment, and spare parts. Address inquiries to FLOW, Box 1454.

POSITION WANTED

DISTRIBUTION — WAREHOUSING MANAGER

Administrator of National Warehousing Programs. Proven results in negotiations, economical multi-plant operations, traffic, material handling, packaging, inventory control. Thorough analyst, procedure writer. Phone N.Y. LExington 2-8490, or write c/o FLOW, Box 1254.

LINES WANTED

We want to represent your company in Metropolitan Detroit and South-eastern Michigan. An established firm wishes a few additional manufacturers to round out a full line of material handling and storage equipment. Reply c/o FLOW, Box 1354.

Large established New England handling equipment distributor with very effective New York sales and engineering organization seeks additional

quality lines on an exclusive basis for the greater New York City area. Particularly interested in conveyors, dockboards and bridge ramps. Write J. M. Flaherty, sales manager, 520 Fifth Ave., New York 36, N. Y.

HELP WANTED

ENGINEERS—CHEMISTS

Opportunities in production, research, and pilot plant development. Experience in foods desirable but not essential. Plans include men from current graduates to 6 to 10 years professional experience. Send complete resume of education and experience to:

Personnel Dept.
PILLSBURY MILLS, INC.
Minneapolis 2, Minn.

National manufacturer of fabricated metal building product requires services of man to analyze present material handling devices and practices in all company plants. Prefer man 30-45 with several years experience, familiar with equipment costs and able to make recommendations. Person selected will be assigned to Industrial Engineering Department. Position involves approximately 50% travel. Please write in confidence, personal resume, experience and past earnings. Write c/o FLOW, Box 1154.

*Imitated by Many—
Not Equaled by Any*

ROURA Self-Dumping HOPPERS SAVE TIME and MONEY

The business principles that stand behind a product's manufacture mean more than just selling any one job. Roura Hoppers are ruggedly built, not to only carry the load, but to stand up under the abuse that all materials handling equipment receives from average lift-truck operators. We have found that it's not the load that destroys equipment but the use and manner that lift-truck operators have of banging into all equipment of this type.

Slash production costs . . . get these 4 plus features: 1. Submerged arc welds that are "stitched" with the same apparatus used for "stitching" high pressure steam boilers, assuring long life; 2. Exclusive, patented instant release handle; 3. Simple, safe material handling; 4. Quality-built, it pays for itself fast many times over. Handling wet or dry, hot or cold bulky materials quickly and easily, Rouras require only one man for distributing and unloading—he does it in a lot less time than under old fashioned methods.

Sizes ½, ¾, 1, 1½ and 2 cubic-yards. Rouras are built to fit either fork or platform type lift-trucks. Can also be had with special combination fork-platform skid, or with a live skid. Can be equipped with special flanges to permit stacking for storage or future distribution of materials, solving floor space limitations.



TRIP RELEASE



IT DUMPS



RETURN



LOCKS ITSELF



Only ROURA Has The Exclusive
PATENTED Instant Release Handle

— Can Be Coated With Acid-Resistant Paints

Write today for detailed brochure, "In Dollars & Sense."

ROURA IRON WORKS, Inc.

1411 Woodland Ave.

Detroit 11, Mich.

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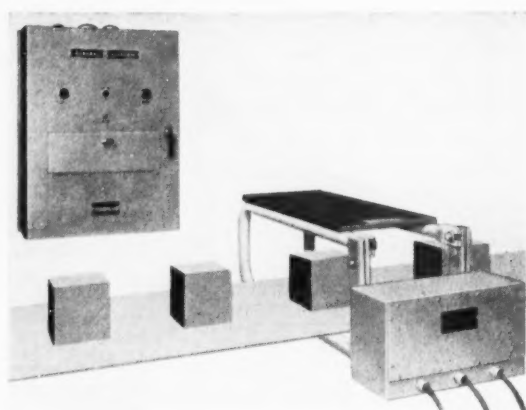
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General-Purpose Metal Detector

A DETECTOR which can be installed around—and without disturbing—conveyors, developed by the Special Products Section of General Electric Co., can be used to detect non-magnetic as well as magnetic metals in the inspection of non-magnetic and non-conductive materials. Belt speeds can range from 90 to 500 ft. per min.

Equipment consists of two main components—an electronic cabinet and an inspection coil system. On the cabinet are controls and indicator. A green light shows when power is applied, a red light is an alarm signal when metal passes through the coil unit, which is slipped over a conveyor type installation. The red light is operated by a relay having auxiliary contacts for other types of alarms, either audio or visual, or to actuate a control circuit. Resetting is done manually, but provision has been made so that a timing system and automatic reset can be employed. A yellow light labelled "balance" indicates when the automatic balance system is not operating or is outside of its limits. This alarm is also relay-operated and has auxiliary contacts.

The versatility of the coil design is said to make the detector useful for many applications—including industrial food operations, mining of non-magnetic and



non-conductive types of ores, and in paper and lumber industries. Coils can be immersed in the log pond and logs floated through for metal inspection. Two standard sizes of coils are available: one rectangular, with inside measurement of 33x10 in.; the other circular, with a 4 ft. diameter. Special sizes can be furnished on request.

Write in No. 261 on Reader Service Card for more information

the **ANSWER** to lifting and dumping bottlenecks

ELIMINATE MANUAL LIFTING and speed up materials handling with a Cesco skip-hoist Dumper. Reduce handling time and costs. Single and multi-purpose portable models in standard heights from 6 to 10 ft. Stationary models to 20 ft. Up to 1500 lb. per load, 100 loads per hour. Easy, safe push-button control eliminates accidents.

**LIFTS AND DUMPS DRUMS, BOXES,
BULK, BAGS. MECHANICALLY**

ESSEX CONVEYORS, INC.
165 Franklin Ave. • Nutley 10, N. J.
COLSON EQUIPMENT & SUPPLY CO.
1317 Willow Street • Los Angeles 13, Calif.



Write
for
Complete
Catalog

CESCO SKIP HOIST DUMPER

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Metal Belts

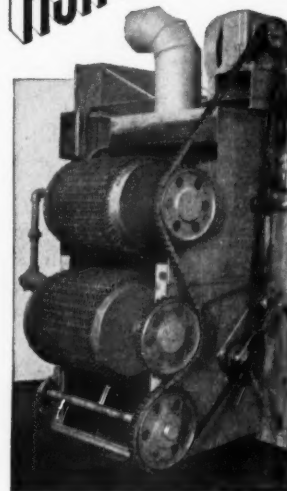
for Processing
and Handling all
Materials . . .

engineered for the
specific end use by

For applications ranging
from subzero to 2100°F.

Our Engineering and
Testing standards are
your assurance of "The
Right Belt" for the job.

ASHWORTH



WRITE FOR
ILLUSTRATED
CATALOG 52F

ASHWORTH BROS., INC.
METAL PRODUCTS DIV. • WORCESTER, MASS.

Sales Engineers:
Seattle • St. Paul •

Buffalo • Chattanooga • Chicago • Cleveland • Detroit • Kansas City
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— Canadian Rep., PECKOVER'S LTD. • Toronto • Montreal

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FLOW • JANUARY, 1954

LOADING OPERATIONS

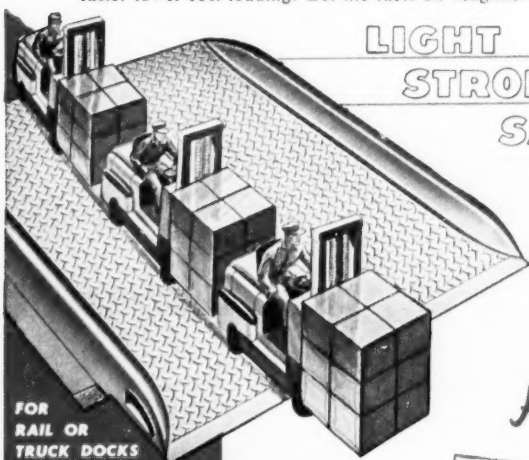
CHOKED...

Are overtaxed shipping and receiving facilities jamming up the loading dock . . . putting a stranglehold on output? Are efforts to increase production and profits hampered by lack of additional loading capacity? There is one *proved* way to multiply loading capacity . . . eliminate bottlenecks . . . prevent costly tie-ups—and all without major capital expenditure! Do as many thousands of leading companies have done. Equip your docks with magnesium-light, magnesium-strong Magliner Dock-Boards! With these low-cost, high output units in operation, you can speed material flow . . . establish faster, easier-access transit between plant and freight carriers . . . and cut loading time to a new low!

Magliner Dock Boards present no expensive installation problem! No fixed inflexibility! Magliners are permanent . . . yet you can move them about, *whenever and wherever you wish!* Fabricated of the world's lightest structural metal, Magliner Dock Boards are easily handled by one man. Of bridge design construction they are capacity rated to handle the heaviest of loads and equipment. Available in 34 standard models, as well as custom engineered to exact requirements. Get the benefits of smoother, faster lower-cost loading! Get the facts on Magliner!



**LIGHT
STRONG
SAFE**

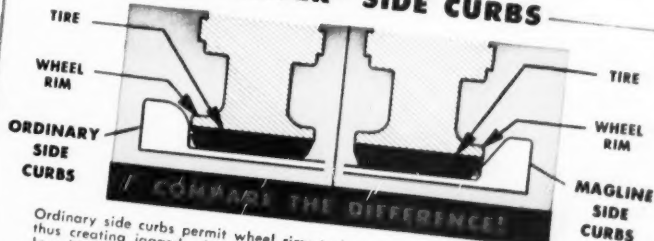


FOR
RAIL OR
TRUCK DOCKS

Mag Liner
MAGNESIUM
DOCK BOARDS

Another great new First from Magliner!

"TIRE SAVER" SIDE CURBS



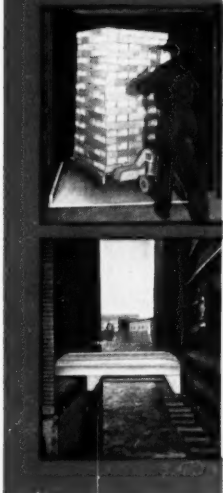
Ordinary side curbs permit wheel rims to bear against and wear into the curb, thus creating jagged edges which soon result in costly, needless tire damage. In addition, such forceful contact weakens the side curb and shortens service life. Design of the new Magliner "Tire-Saver" side curb specifically prevents metal-to-metal contact . . . wheel-to-curb collision—eliminating the single biggest cause of tire and dock board damage!

EQUIPMENT UNDERCLEARANCE

Low side curbs, proper board length, precise crowning. All combine to insure absolute underclearance for low handling equipment.

LONG SPANS

Ample strength, rigid structure, safe, easy crossover. For all span requirements—short or long!



WRITE TODAY for Information Bulletin DB-204R

MAGLINE, INC. • P.O. BOX 346 • PINCONNING, MICH.

Circle No. 90 on Reader Service Card for more information

Did you need a secretary when you were sixteen?

Well, teenagers like this know the value of all the parts and personnel of a typical business organization. They're real businessmen and businesswomen on a small scale—forming their own company, floating stock, manufacturing their own products, keeping books, conducting advertising and promotion . . . and distributing dividends.

Long before they leave school, they'll be well acquainted with the business methods that have contributed to our prosperity. They'll have learned, first hand, what makes our economy tick—through Junior Achievement!

Sponsored by a long list of America's leading business firms, Junior Achievement gives young people a chance to experience—under the guidance of successful business men—the ins and outs of a commercial venture before they enter the adult business world. They're shown how enterprise and hard work turn into actual cash.

Because it's training in the ways of American free enterprise—because it's an answer to the youth-indoctrination programs of other ideologies—Junior Achievement is a positive step toward a bright economic future for this country.

FLOW MAGAZINE

BUILDING — THROUGH BUSINESS — FOR A BETTER AMERICA!

support Junior Achievement



Junior
Achievement
Week
January 31-
February 6, 1954

